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NetAccountability Method Overview FIGURE 1

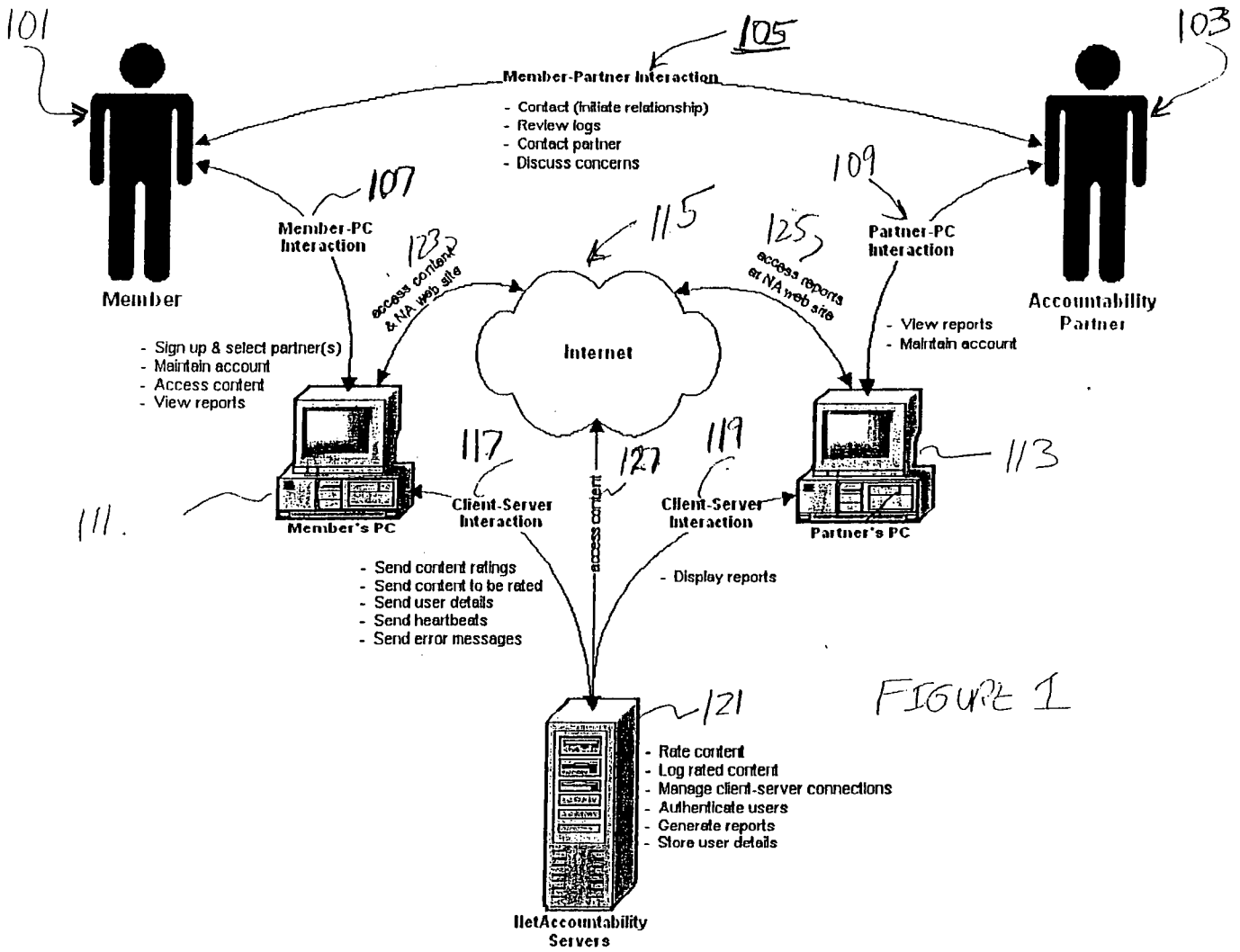


FIGURE 1

NetAccountability System
Functional Decomposition Diagram

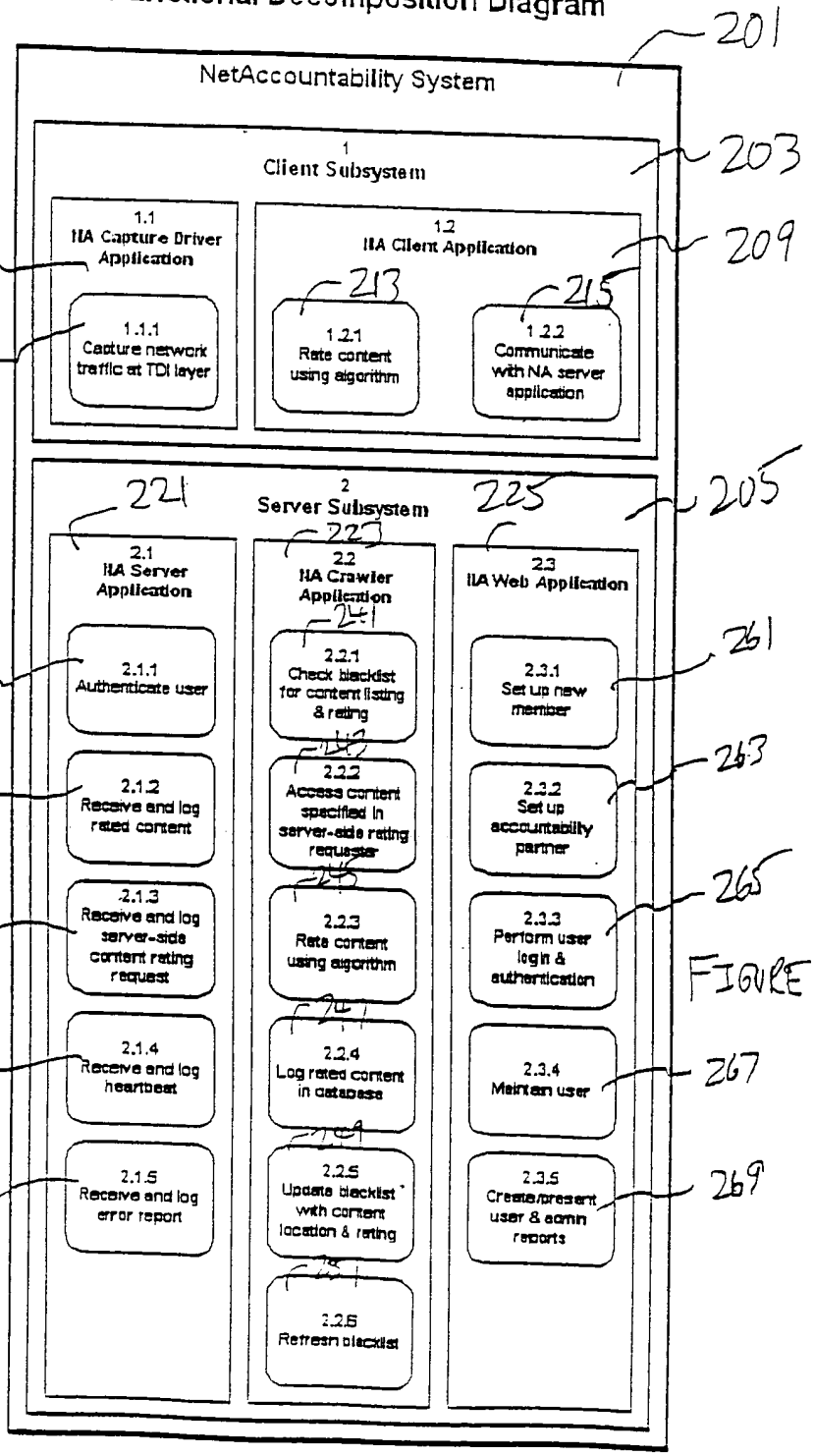


FIGURE 2

FIGURE 3

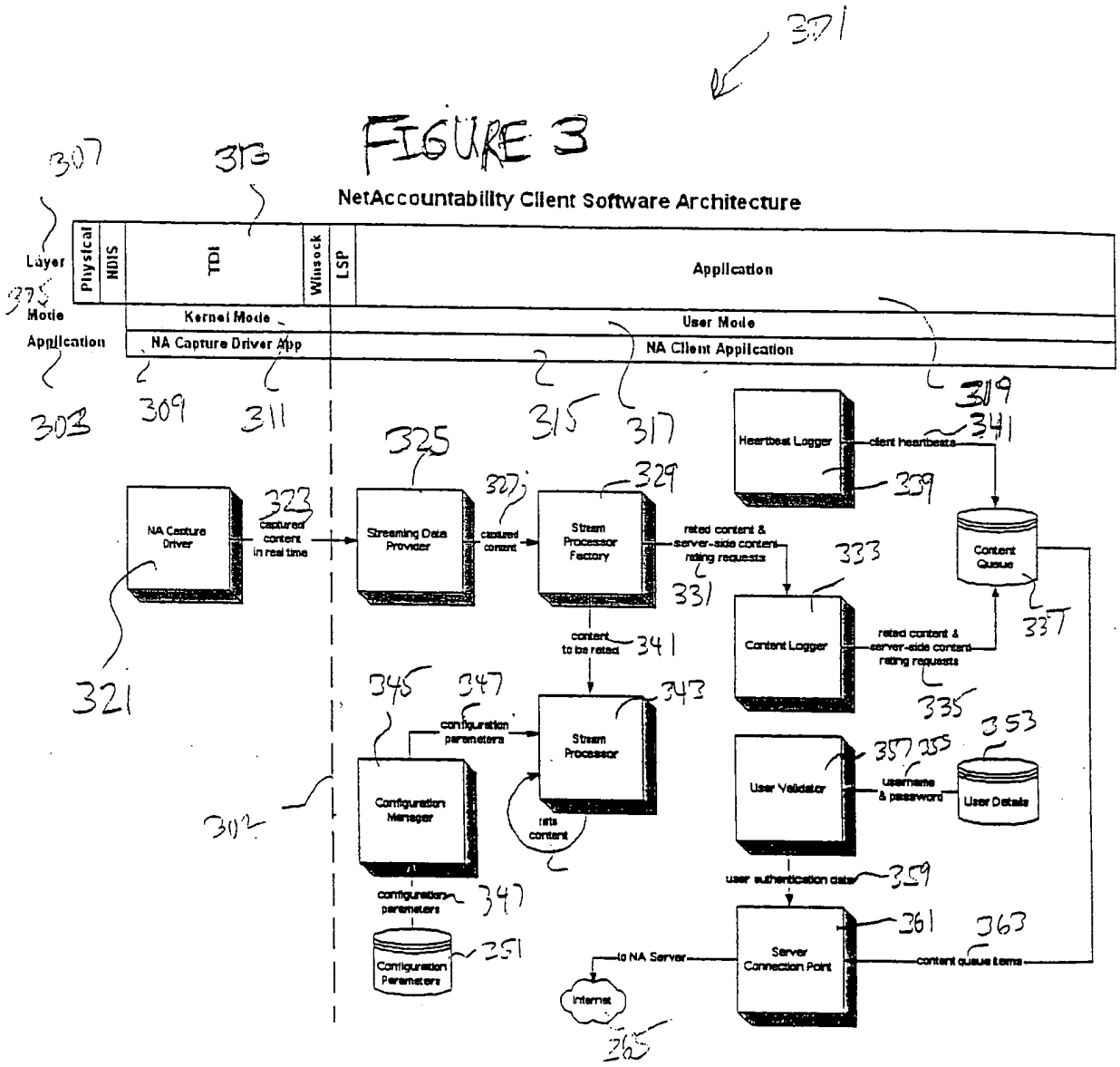
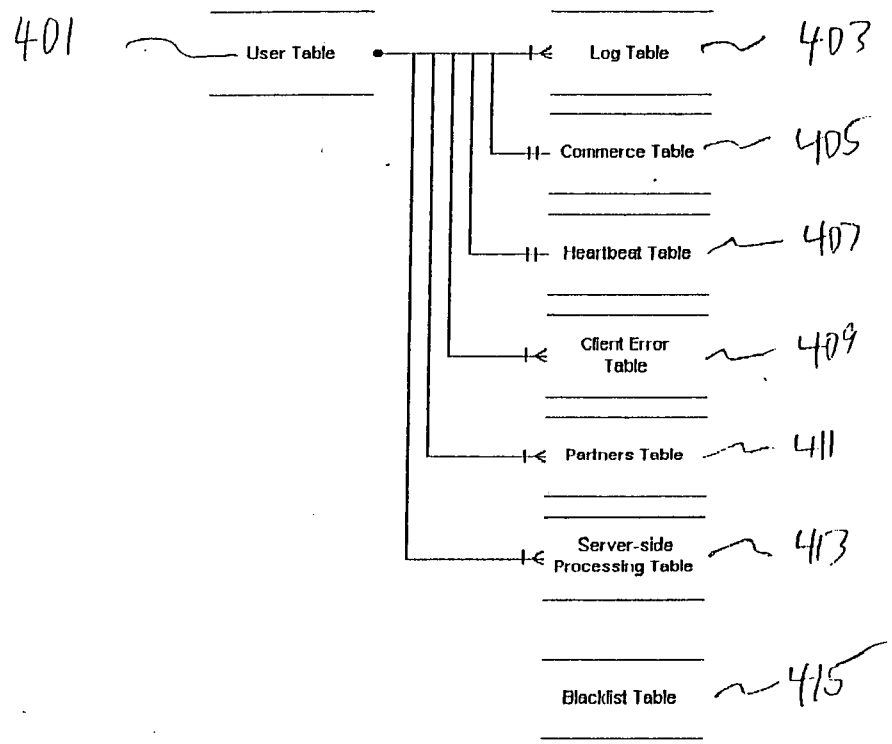
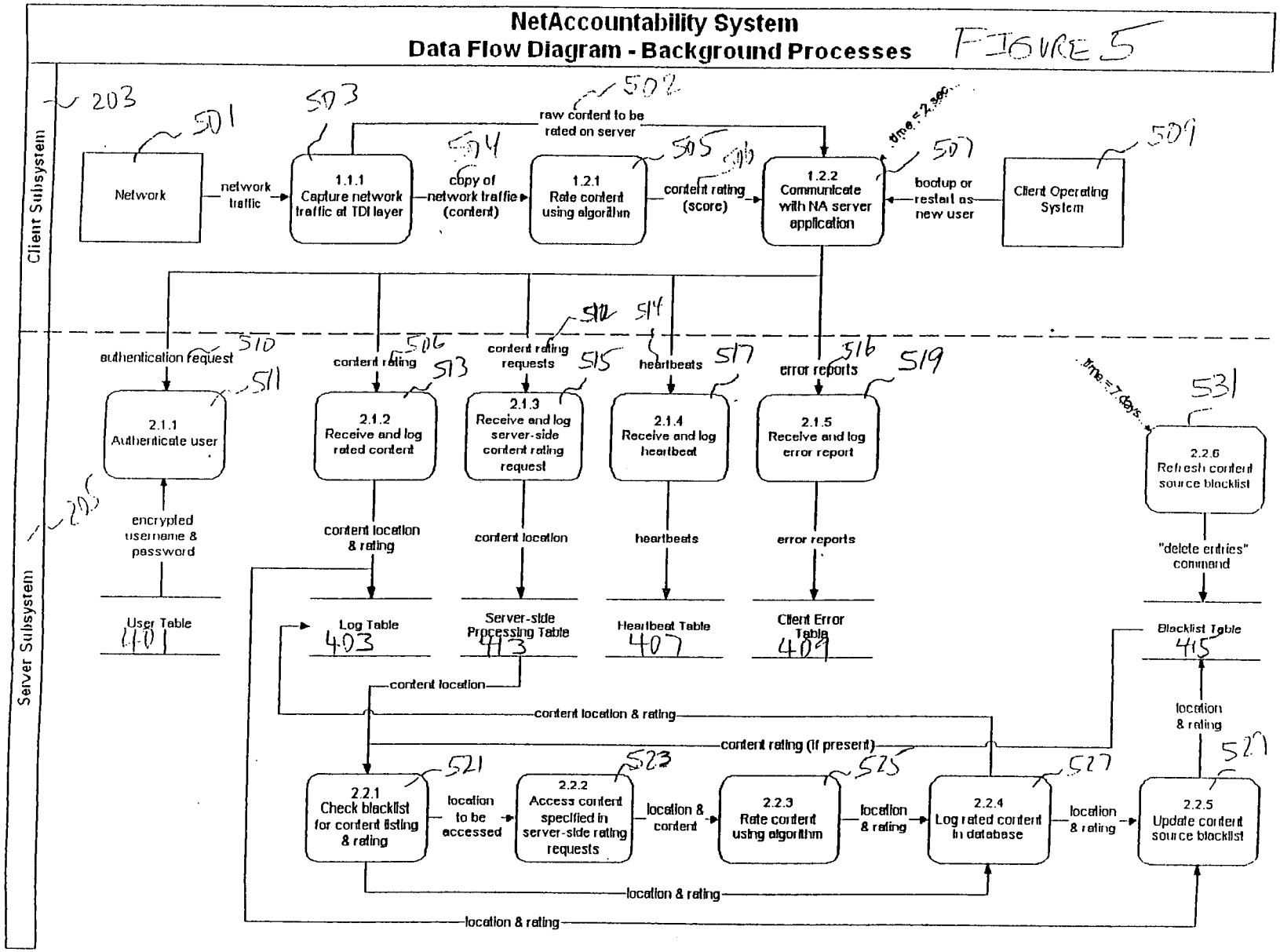

NetAccountability Client Software Architecture
Layer
Mode
Application
Physical
NDIS
TDI
Winsock
LSP
Application
Kernel Mode
User Mode
NA Capture Driver App
NA Client Application
NA Capture Driver
captured content in real time
Streaming Data Provider
captured content
Stream Processor Factory
rated content & server-side content rating requests
Heartbeat Logger
client heartbeats
Content Queue
Content Logger
rated content & server-side content rating requests
content to be rated
Stream Processor
rata content
Configuration Manager
configuration parameters
Configuration Parameters
User Validator
username & password
User Details
user authentication data
Server Connection Point
to NA Server
content queue items
Internet

FIGURE 4

NetAccountability System
Simplified Entity Relationship Diagram




NetAccountability System
Data Flow Diagram - Background Processes
FIGURE 5
Client Subsystem
Server Subsystem
203
Network
network traffic
1.1.1 Capture network traffic at TDI layer
copy of network traffic (content)
1.2.1 Rate content using algorithm
content rating (score)
1.2.2 Communicate with NA server application
bootup or restart as new user
Client Operating System
raw content to be rated on server
time = 7 days
authentication request
content rating
content rating requests
heartbeats
error reports
2.1.1 Authenticate user
2.1.2 Receive and log rated content
2.1.3 Receive and log server-side content rating request
2.1.4 Receive and log heartbeat
2.1.5 Receive and log error report
2.2.6 Refresh content source blacklist
encrypted username & password
content location & rating
content location
heartbeats
error reports
"delete entries" command
User Table
Log Table
Server-side Processing Table
Heartbeat Table
Client Error Table
Blacklist Table
content location
content location & rating
content rating (if present)
location & rating
2.2.1 Check blacklist for content listing & rating
location to be accessed
2.2.2 Access content specified in server-side rating requests
location & content
2.2.3 Rate content using algorithm
location & rating
2.2.4 Log rated content in database
location & rating
2.2.5 Update content source blacklist
location & rating
location & rating

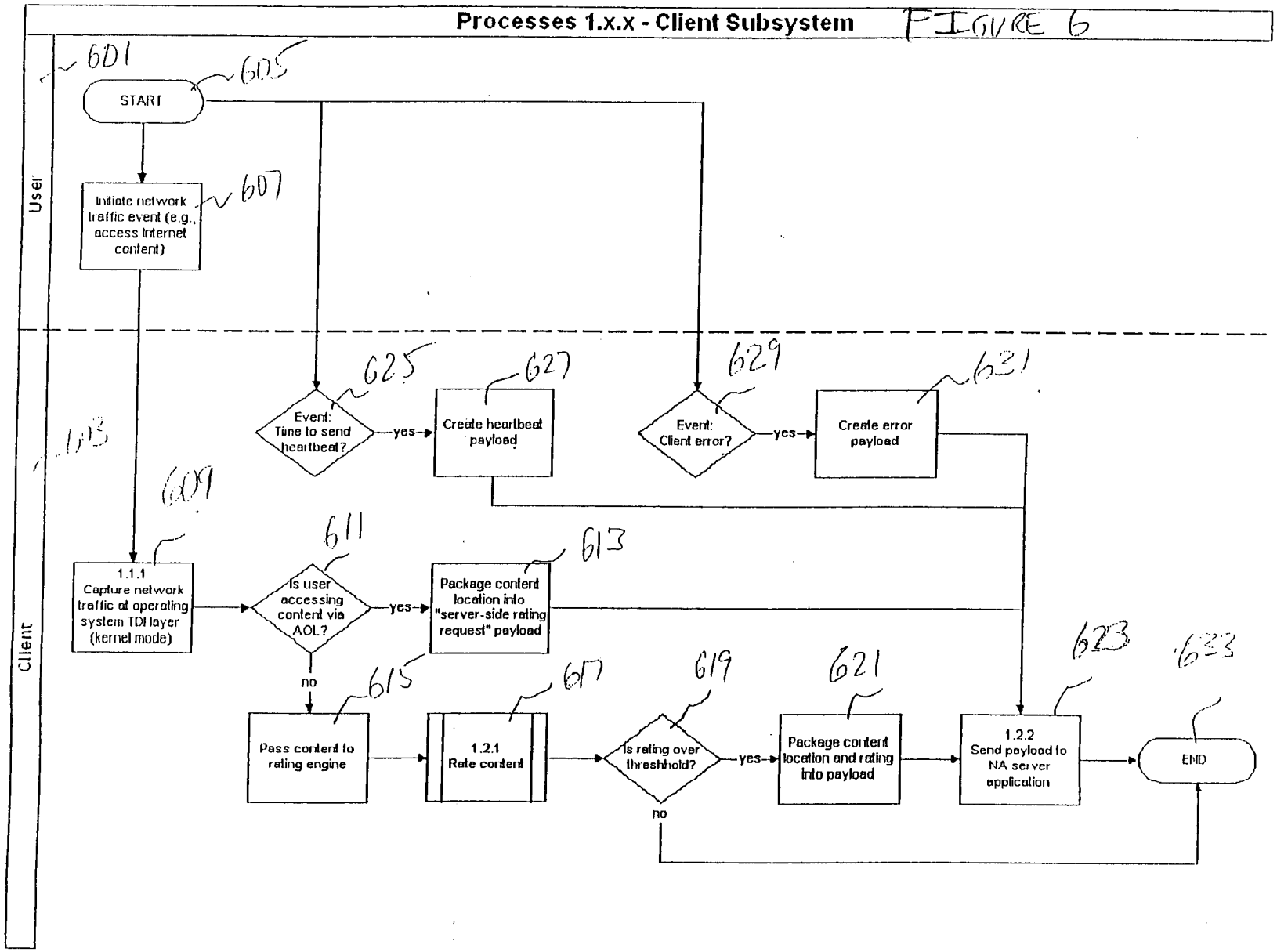
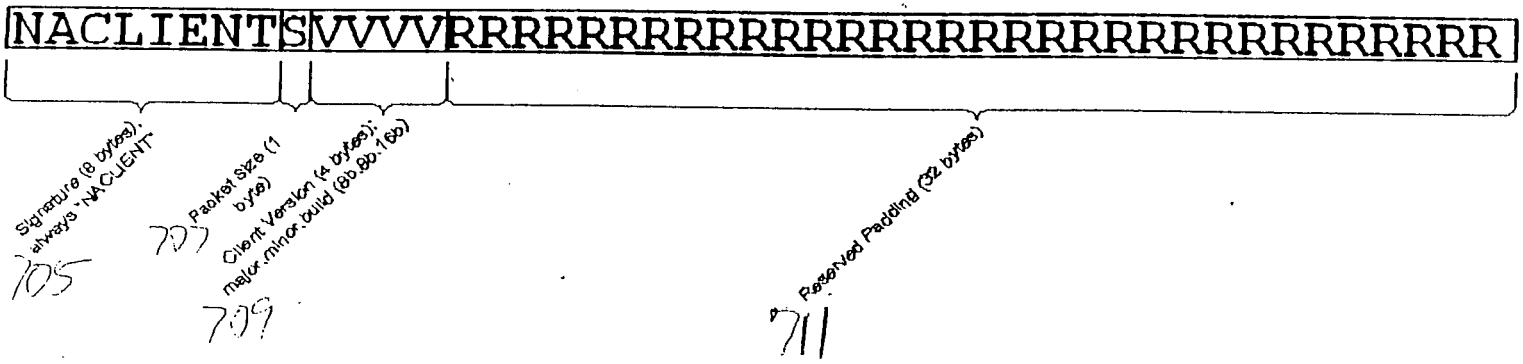

Processes 1.x.x - Client Subsystem
FIGURE 6
User
Client
601
605
START
Initiate network traffic event (e.g., access Internet content)
607
603
625
Event: Time to send heartbeat?
yes
627
Create heartbeat payload
629
Event: Client error?
yes
631
Create error payload
609
1.1.1 Capture network traffic at operating system TDI layer (kernel mode)
611
Is user accessing content via AOL?
yes
613
Package content location into "server-side rating request" payload
no
615
Pass content to rating engine
617
1.2.1 Rate content
619
Is rating over threshhold?
yes
621
Package content location and rating info payload
no
623
1.2.2 Send payload to NA server application
633
END

FIGURE 7

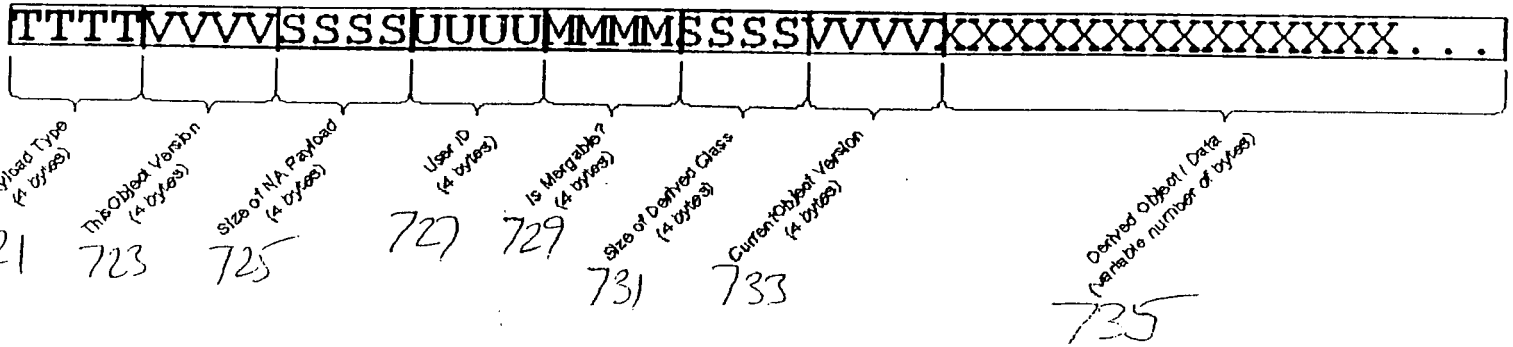
701

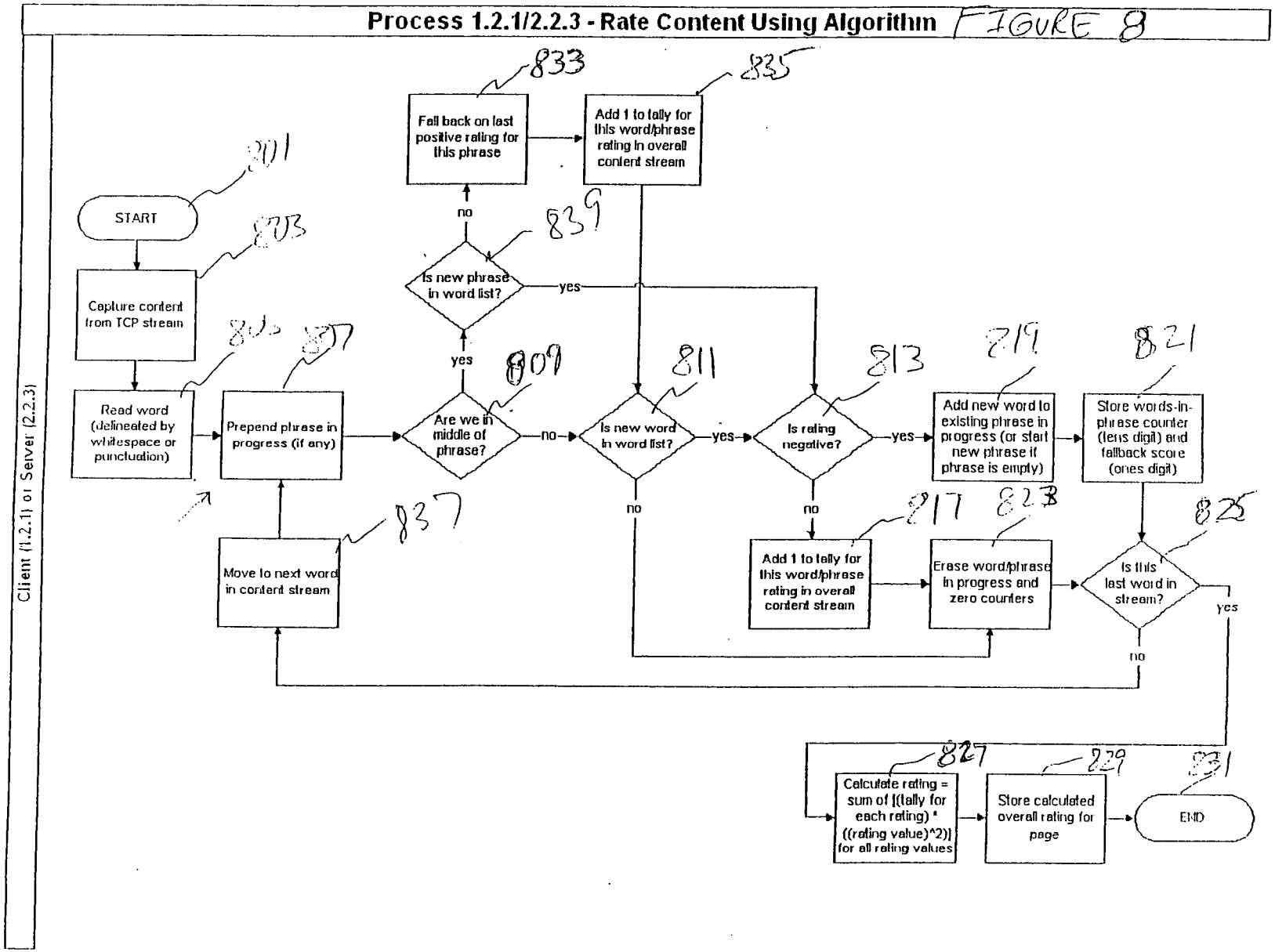
NetAccountability Connection Request Packet



703

NetAccountability Generic Payload




Process 1.2.1/2.2.3 - Rate Content Using Algorithm
FIGURE 8
Client (1.2.1) or Server (2.2.3)
START
Capture content from TCP stream
Read word (delineated by whitespace or punctuation)
Prepend phrase in progress (if any)
Are we in middle of phrase?
Is new phrase in word list?
Fall back on last positive rating for this phrase
Add 1 to tally for this word/phrase rating in overall content stream
Is new word in word list?
Is rating negative?
Add new word to existing phrase in progress (or start new phrase if phrase is empty)
Store words-in-phrase counter (tens digit) and fallback score (ones digit)
Move to next word in content stream
Add 1 to tally for this word/phrase rating in overall content stream
Erase word/phrase in progress and zero counters
Is this last word in stream?
Calculate rating = sum of [(tally for each rating) * ((rating value)^2)] for all rating values
Store calculated overall rating for page
END
yes
no

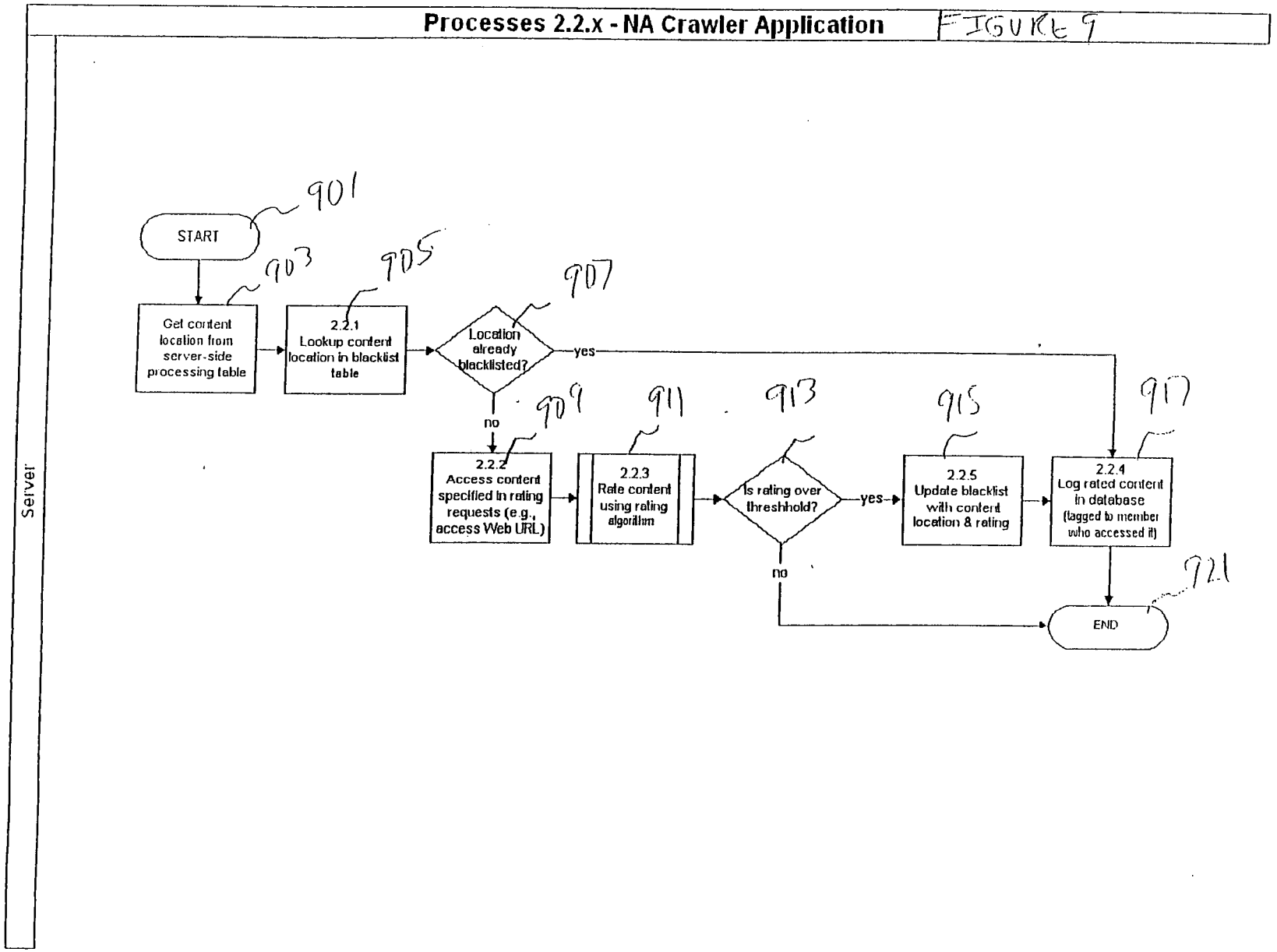
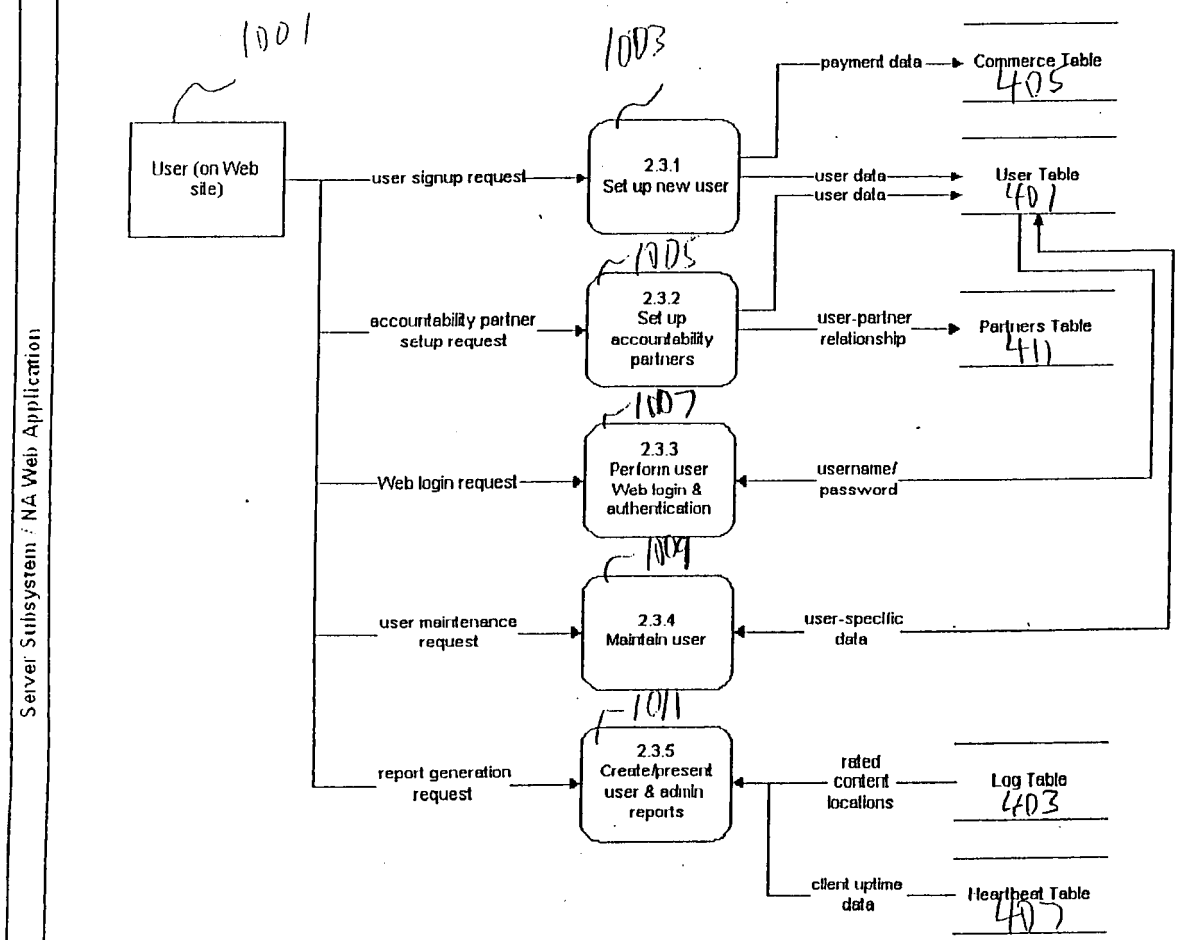
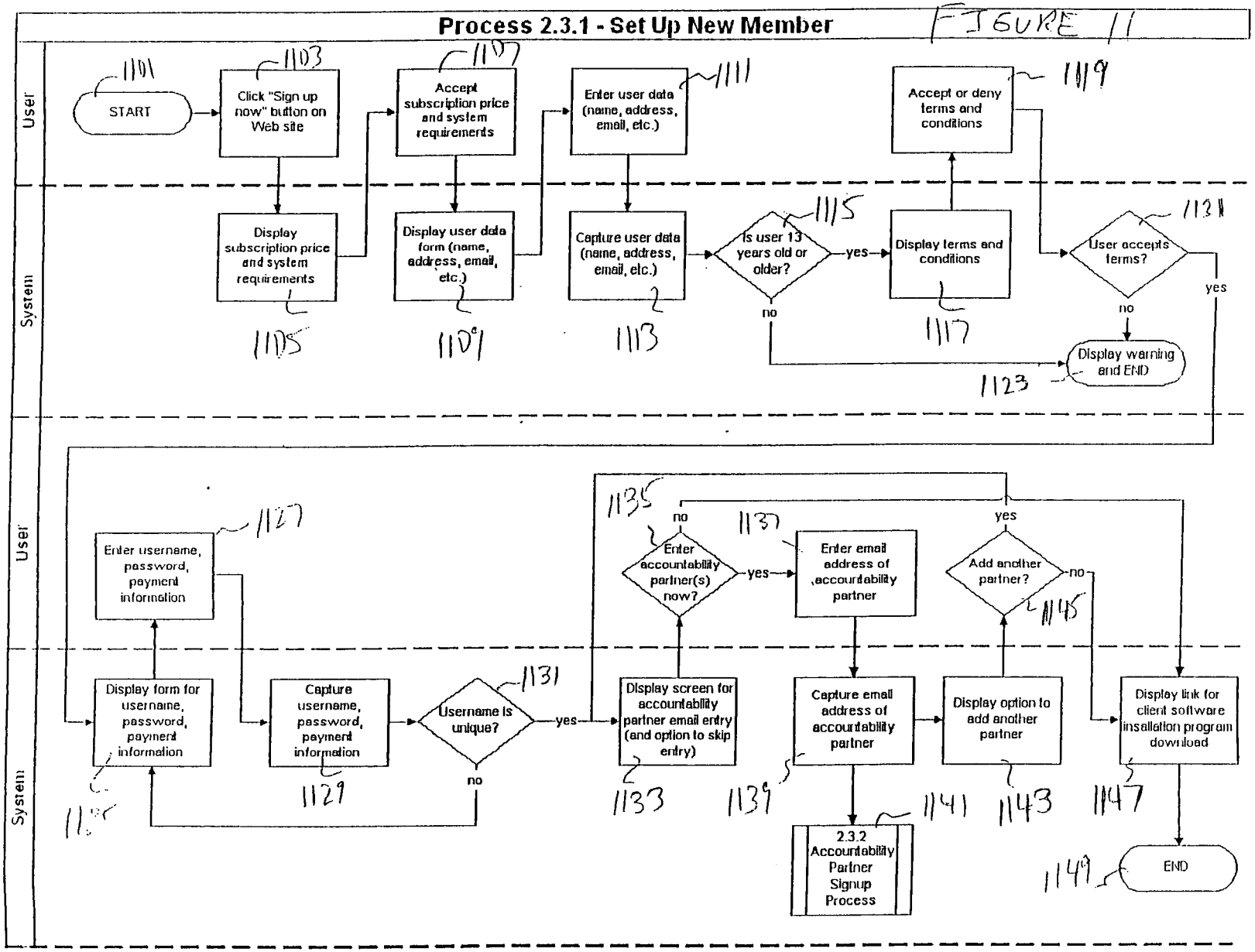
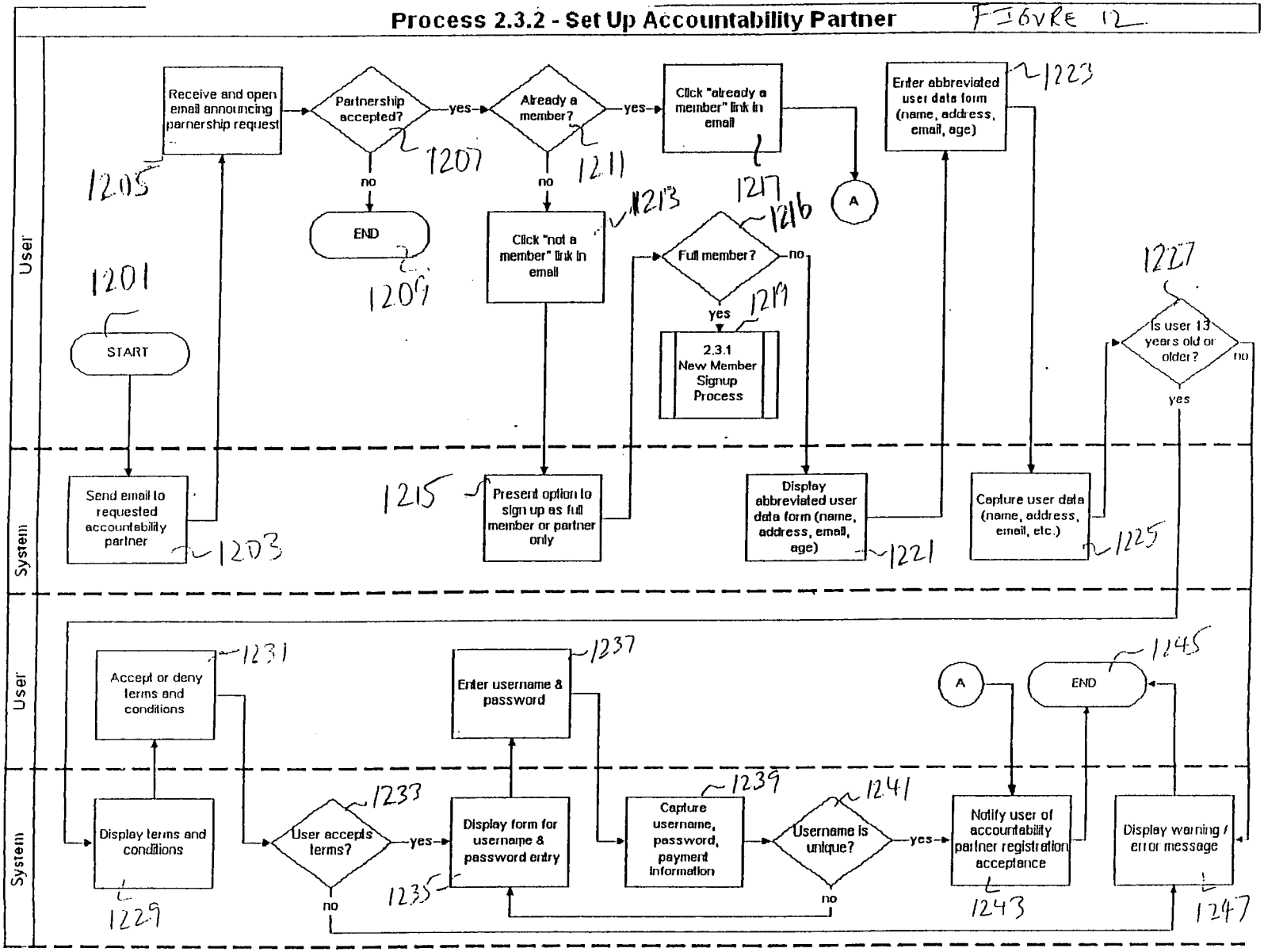

Processes 2.2.x - NA Crawler Application
FIGURE 9
Server
START
901
Get content location from server-side processing table
903
2.2.1 Lookup content location in blacklist table
905
Location already blacklisted?
907
yes
no
2.2.2 Access content specified in rating requests (e.g., access Web URL)
909
2.2.3 Rate content using rating algorithm
911
Is rating over threshhold?
913
yes
no
2.2.5 Update blacklist with content location & rating
915
2.2.4 Log rated content in database (tagged to member who accessed it)
917
END
921

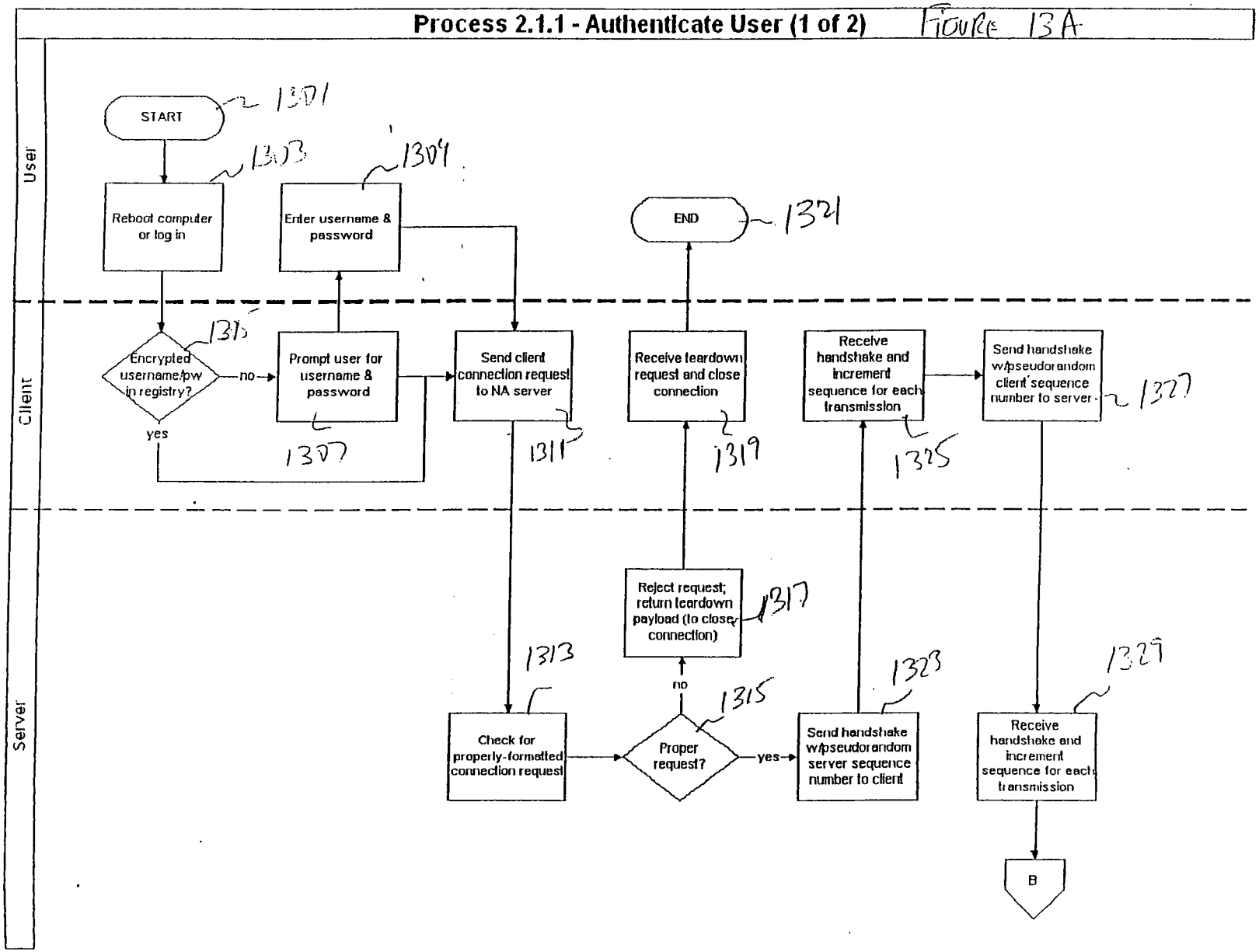
FIGURE 10

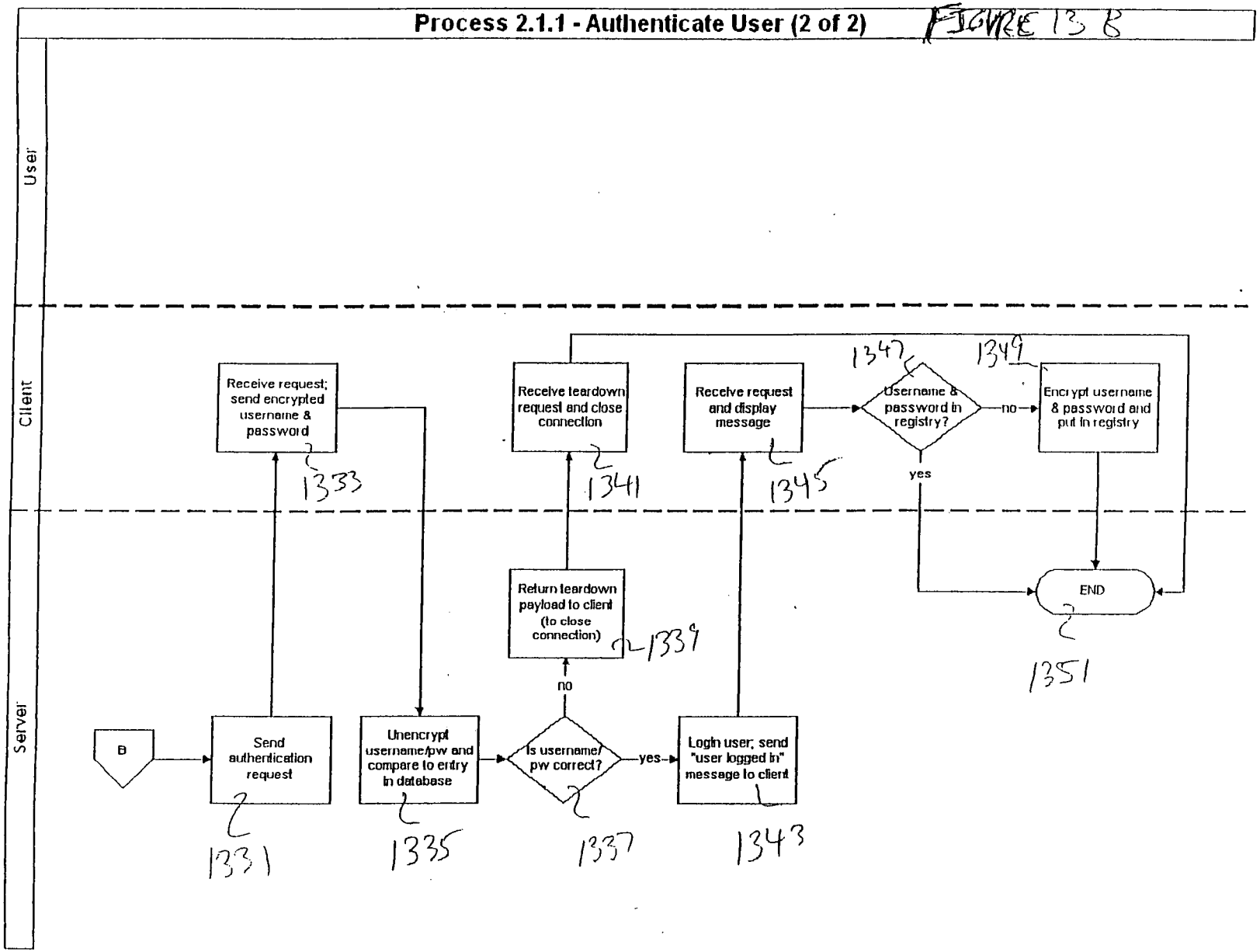
NetAccountability System
Data Flow Diagram - User-initiated Processes




Process 2.3.1 - Set Up New Member
FIGURE 11
User
System
User
System
START
1101
Click "Sign up now" button on Web site
1103
Display subscription price and system requirements
1105
Accept subscription price and system requirements
1107
Display user data form (name, address, email, etc.)
1109
Enter user data (name, address, email, etc.)
1111
Capture user data (name, address, email, etc.)
1113
Is user 13 years old or older?
1115
yes
no
Display terms and conditions
1117
Accept or deny terms and conditions
1119
User accepts terms?
1121
yes
no
Display warning and END
1123
Enter username, password, payment information
1127
Display form for username, password, payment information
1125
Capture username, password, payment information
1129
Username is unique?
1131
yes
no
Enter accountability partner(s) now?
1135
no
yes
Enter email address of accountability partner
1137
Display screen for accountability partner email entry (and option to skip entry)
1133
Capture email address of accountability partner
1139
Add another partner?
1145
yes
no
Display option to add another partner
1143
Display link for client software installation program download
1147
2.3.2 Accountability Partner Signup Process
1141
END
1149


Process 2.3.2 - Set Up Accountability Partner
FIGURE 12
User
System
User
System
Receive and open email announcing parnership request
Partnership accepted?
yes
Already a member?
yes
Click "already a member" link in email
Enter abbreviated user data form (name, address, email, age)
1205
1207
1211
1223
no
no
END
1209
Click "not a member" link in email
1213
Full member?
no
1216
A
1217
1201
START
yes
1219
2.3.1 New Member Signup Process
1227
Is user 13 years old or older?
no
yes
Send email to requested accountability partner
1203
1215
Present option to sign up as full member or partner only
Display abbreviated user data form (name, address, email, age)
1221
Capture user data (name, address, email, etc.)
1225
Accept or deny terms and conditions
1231
Enter username & password
1237
A
END
1245
Display terms and conditions
1229
User accepts terms?
1233
yes
no
Display form for username & password entry
1235
Capture username, password, payment information
1239
Username is unique?
1241
yes
no
Notify user of accountability partner registration acceptance
1243
Display warning / error message
1247


Process 2.1.1 - Authenticate User (1 of 2)
FIGURE 13A
User
Client
Server
START
1301
Reboot computer or log in
1303
Enter username & password
1304
END
1321
Encrypted username/pw in registry?
1305
no
yes
Prompt user for username & password
1307
Send client connection request to NA server
1311
Receive teardown request and close connection
1319
Receive handshake and increment sequence for each transmission
1325
Send handshake w/pseudorandom client sequence number to server
1327
Reject request; return teardown payload (to close connection)
1317
no
Check for properly-formatted connection request
1313
Proper request?
1315
yes
Send handshake w/pseudorandom server sequence number to client
1323
Receive handshake and increment sequence for each transmission
1329
B


Process 2.1.1 - Authenticate User (2 of 2)
FIGURE 13B
User
Client
Server
Receive request; send encrypted username & password
1333
Receive teardown request and close connection
1341
Receive request and display message
1345
1347
Username & password in registry?
no
yes
1349
Encrypt username & password and put in registry
END
1351
Return teardown payload to client (to close connection)
1339
no
B
Send authentication request
1331
Unencrypt username/pw and compare to entry in database
1335
Is username/ pw correct?
1337
yes
Login user; send "user logged in" message to client
1343

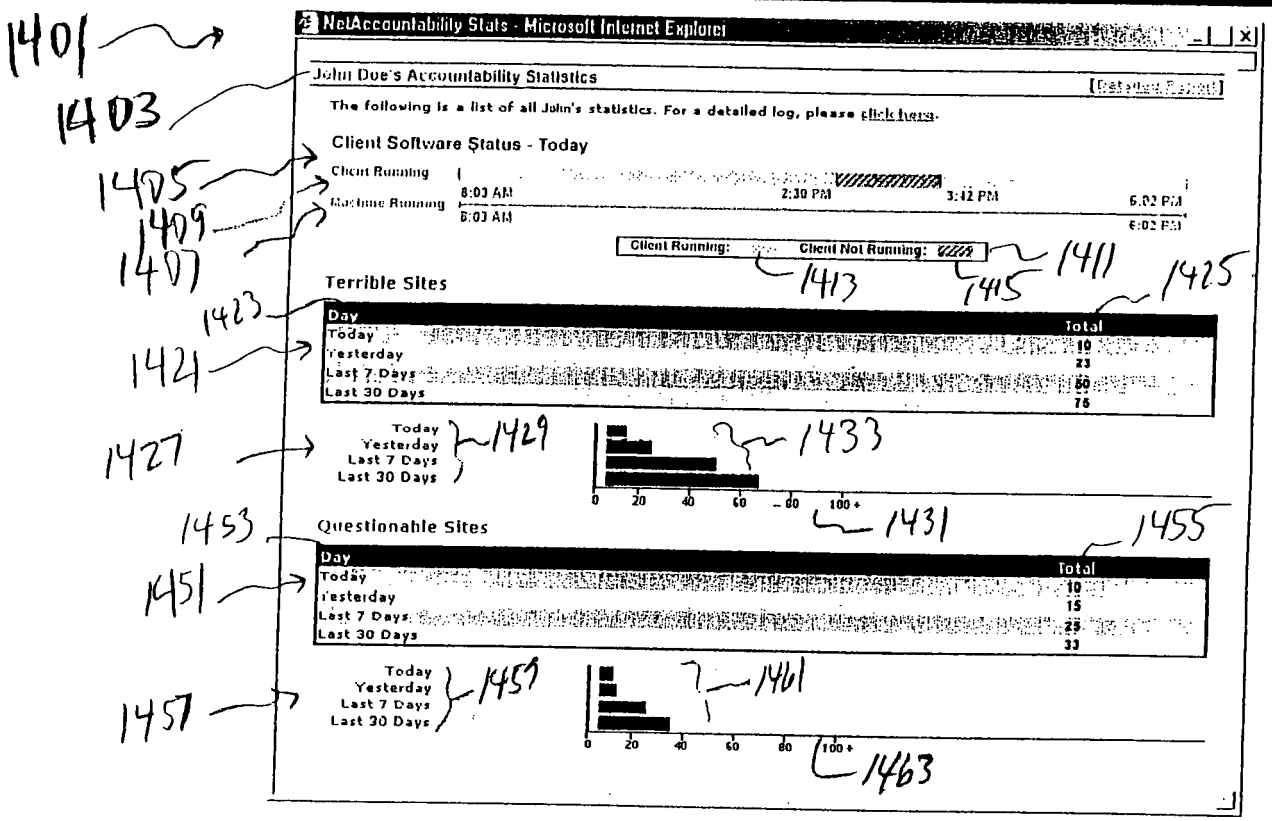
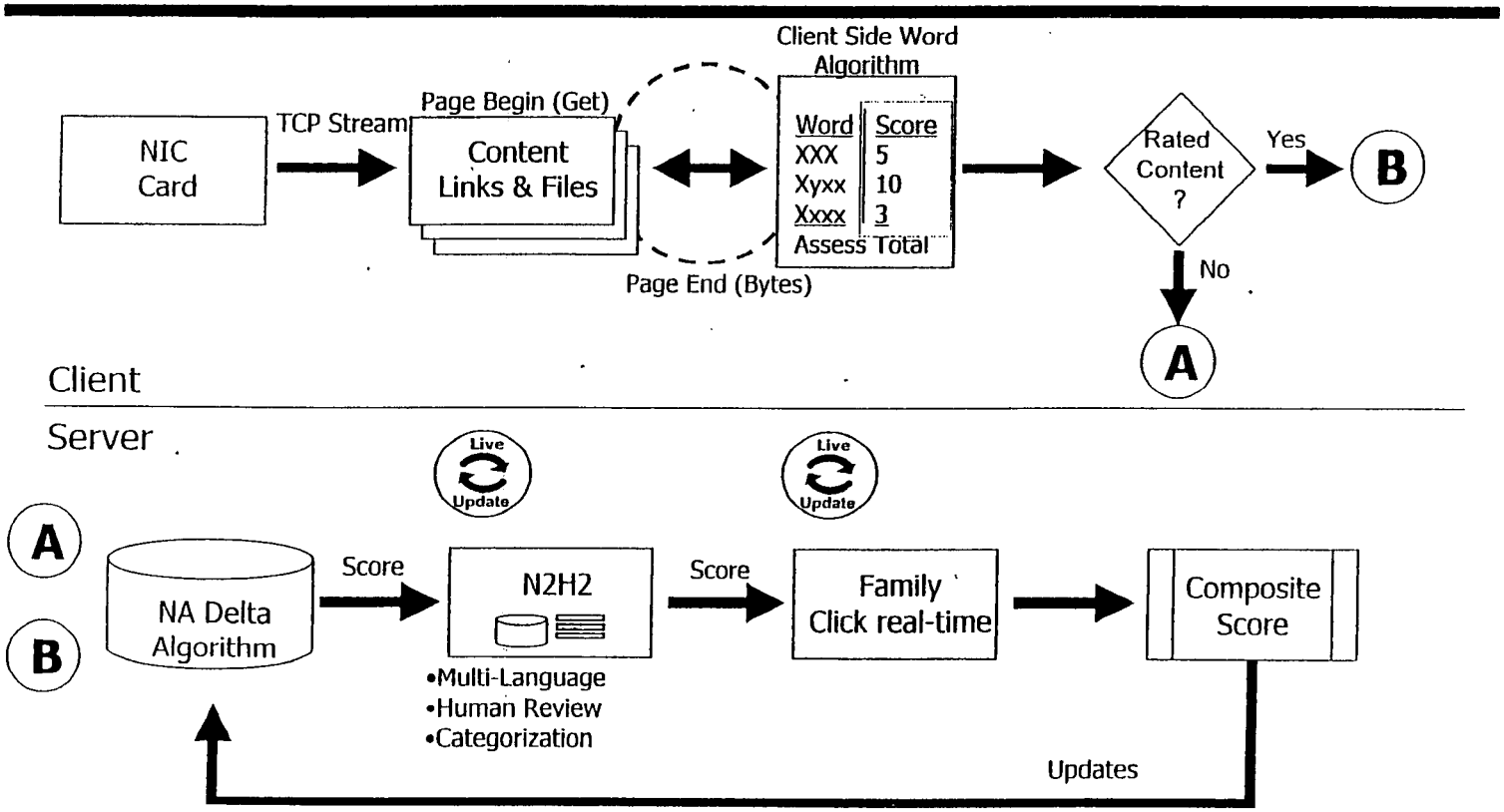


FIG 14

Benefits >>

FIG 15.


Client Side Word Algorithm
NIC Card
TCP Stream
Page Begin (Get)
Content Links & Files
Page End (Bytes)
Word
Score
XXX
5
Xyxx
10
Xxxx
3
Assess Total
Rated Content ?
Yes
B
No
A
Client
Server
Live Update
Live Update
A
B
NA Delta Algorithm
Score
N2H2
•Multi-Language
•Human Review
•Categorization
Score
Family Click real-time
Composite Score
Updates

Content Rating Logic Diagram (Content Rating Object)

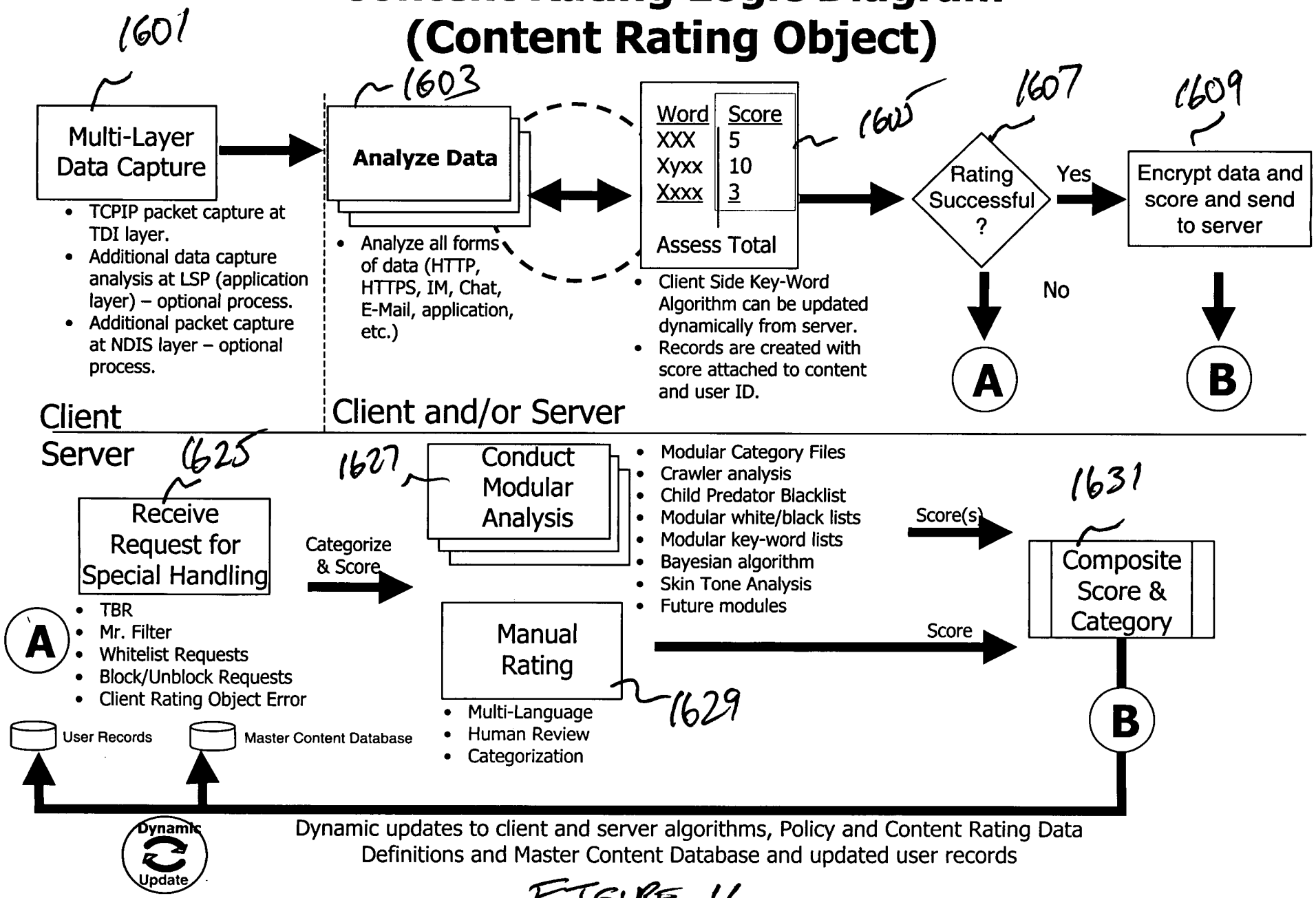


FIGURE 16

System for distributed data mining and content rating

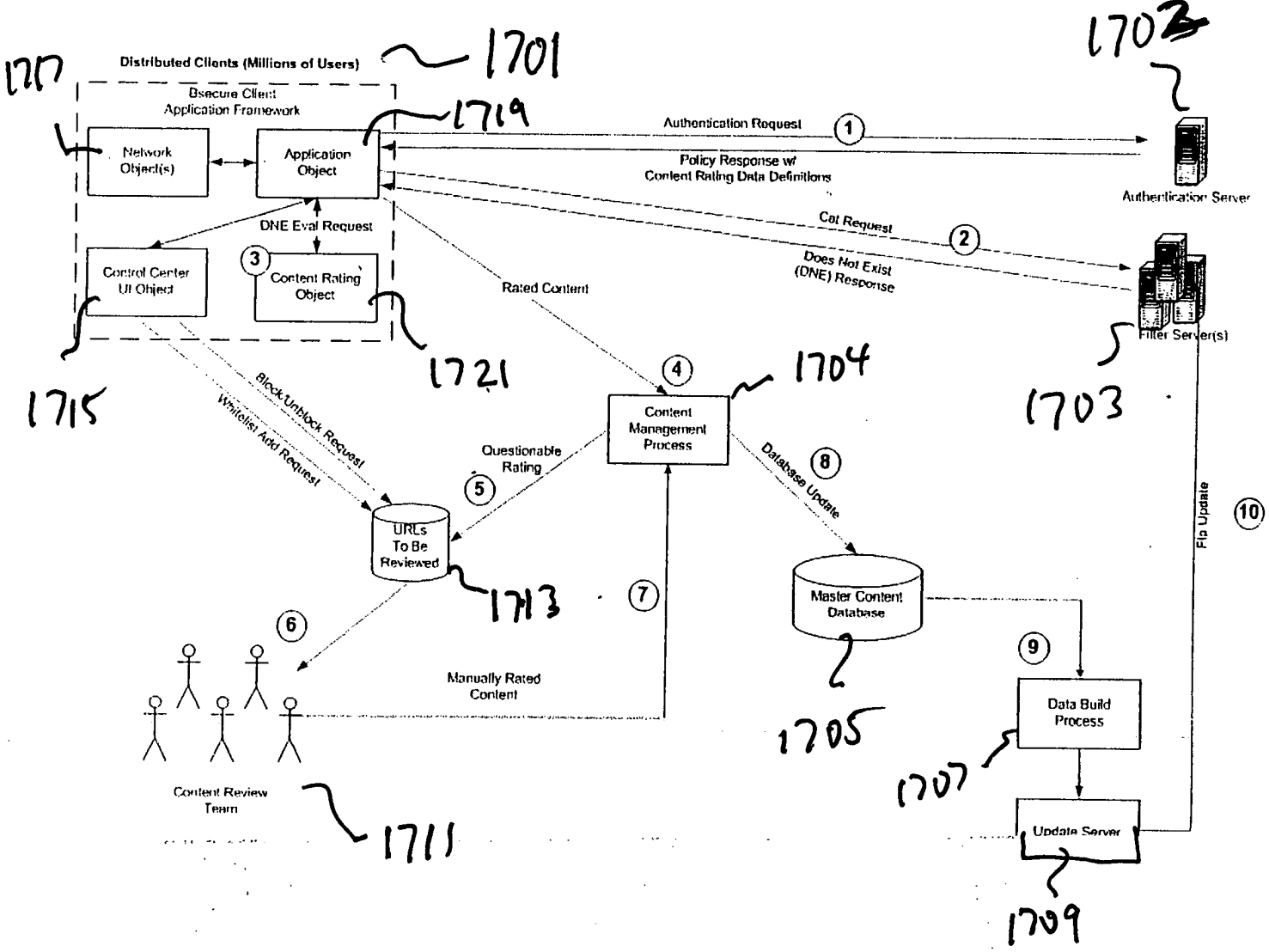


FIG 17

System to provide Integrated Internet Protection Services (filtering, firewall, popup control, antivirus, reporting, Instant Message filtering, spam filter)

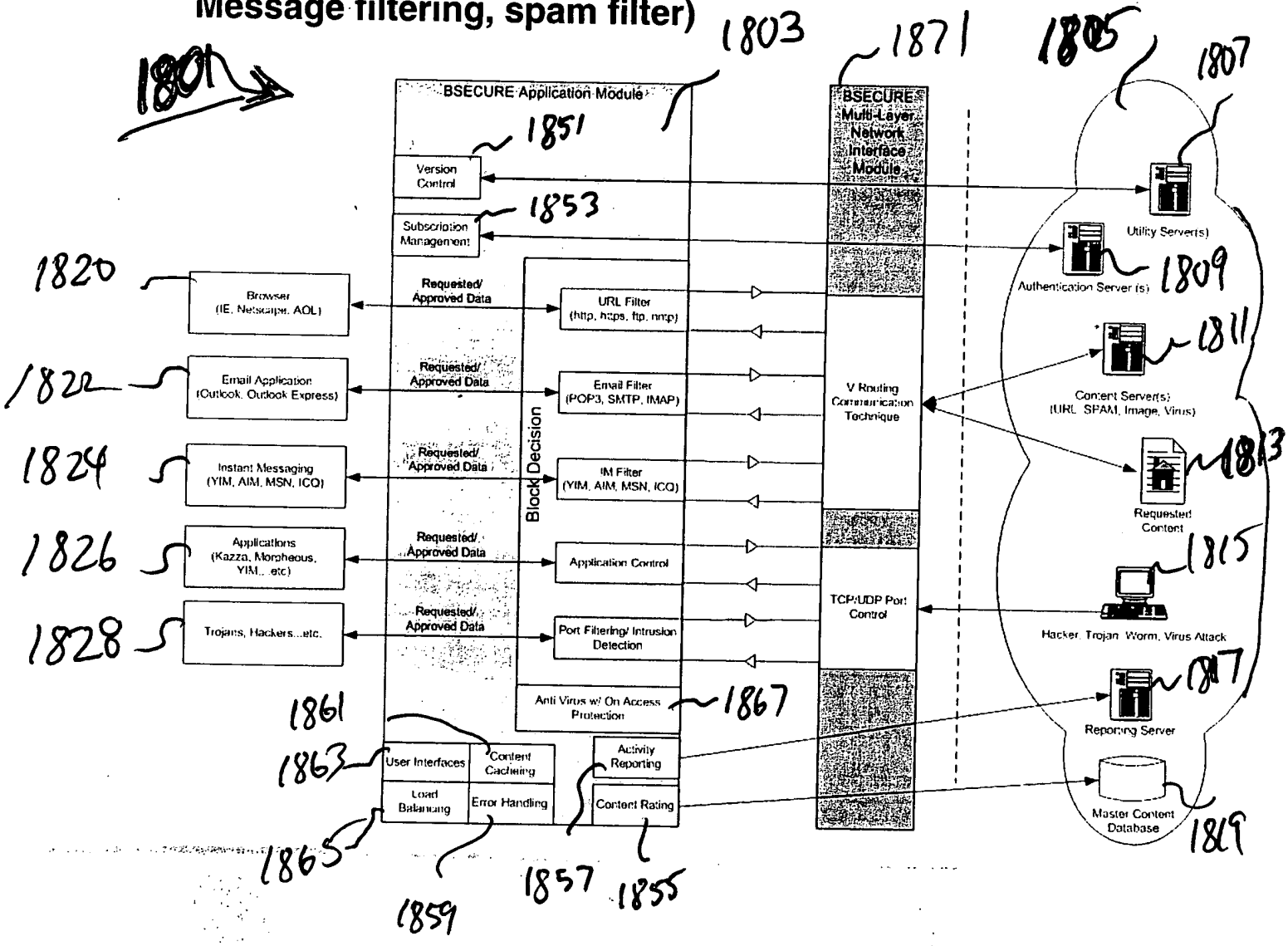
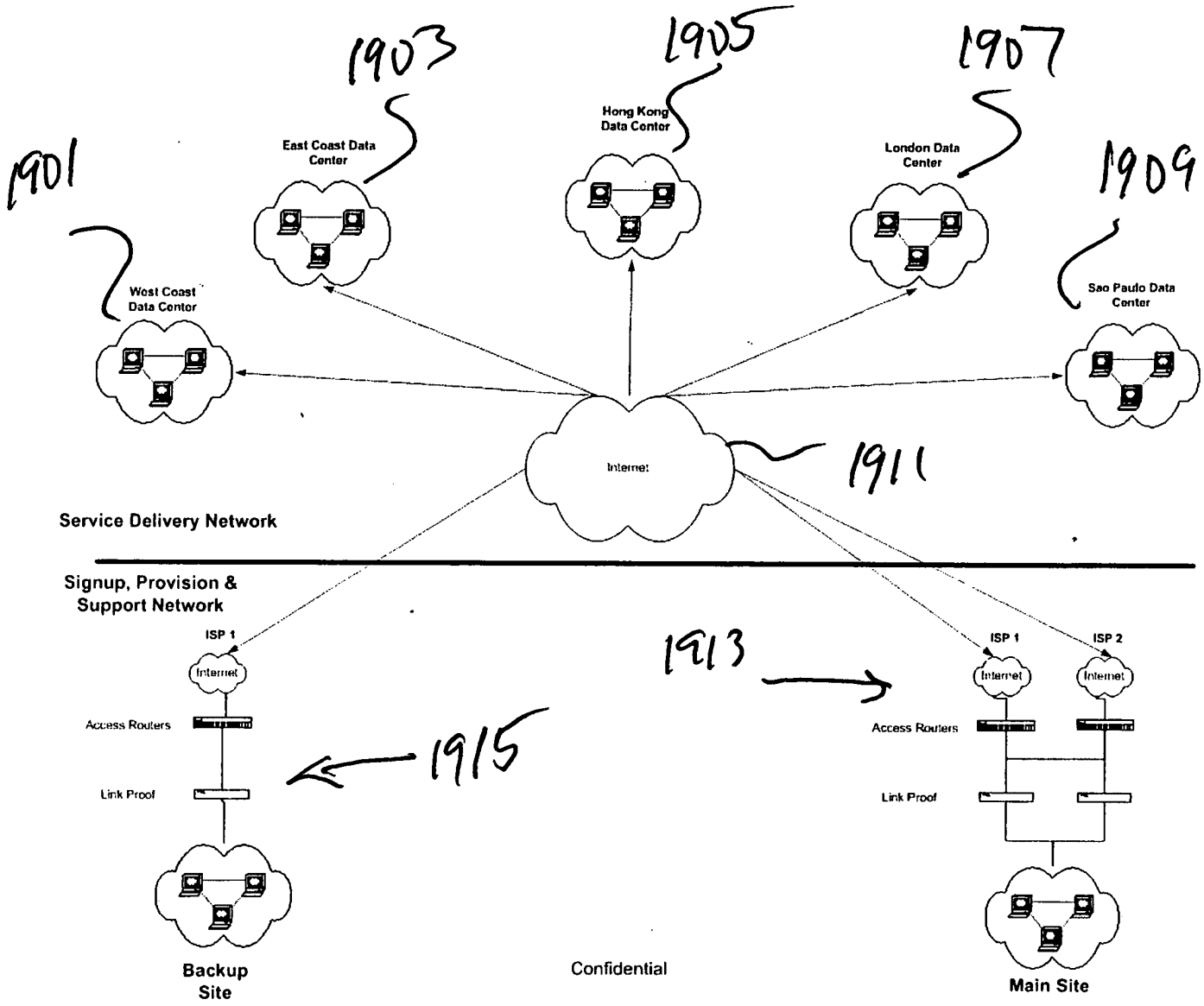


FIG 18



Confidential

FIG 19

Colocat d Servic
Delivery Data Center(s)

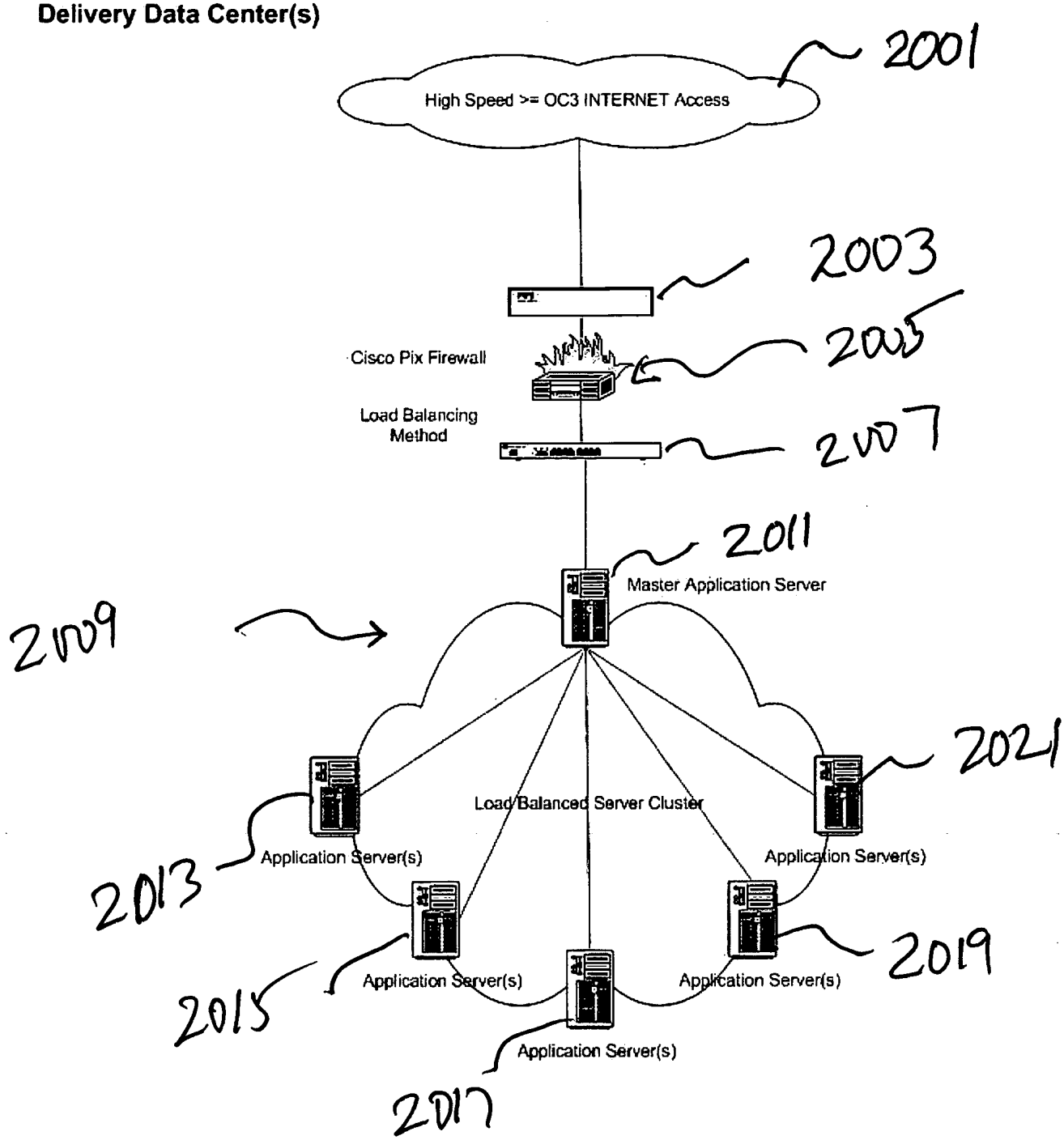


FIG 20

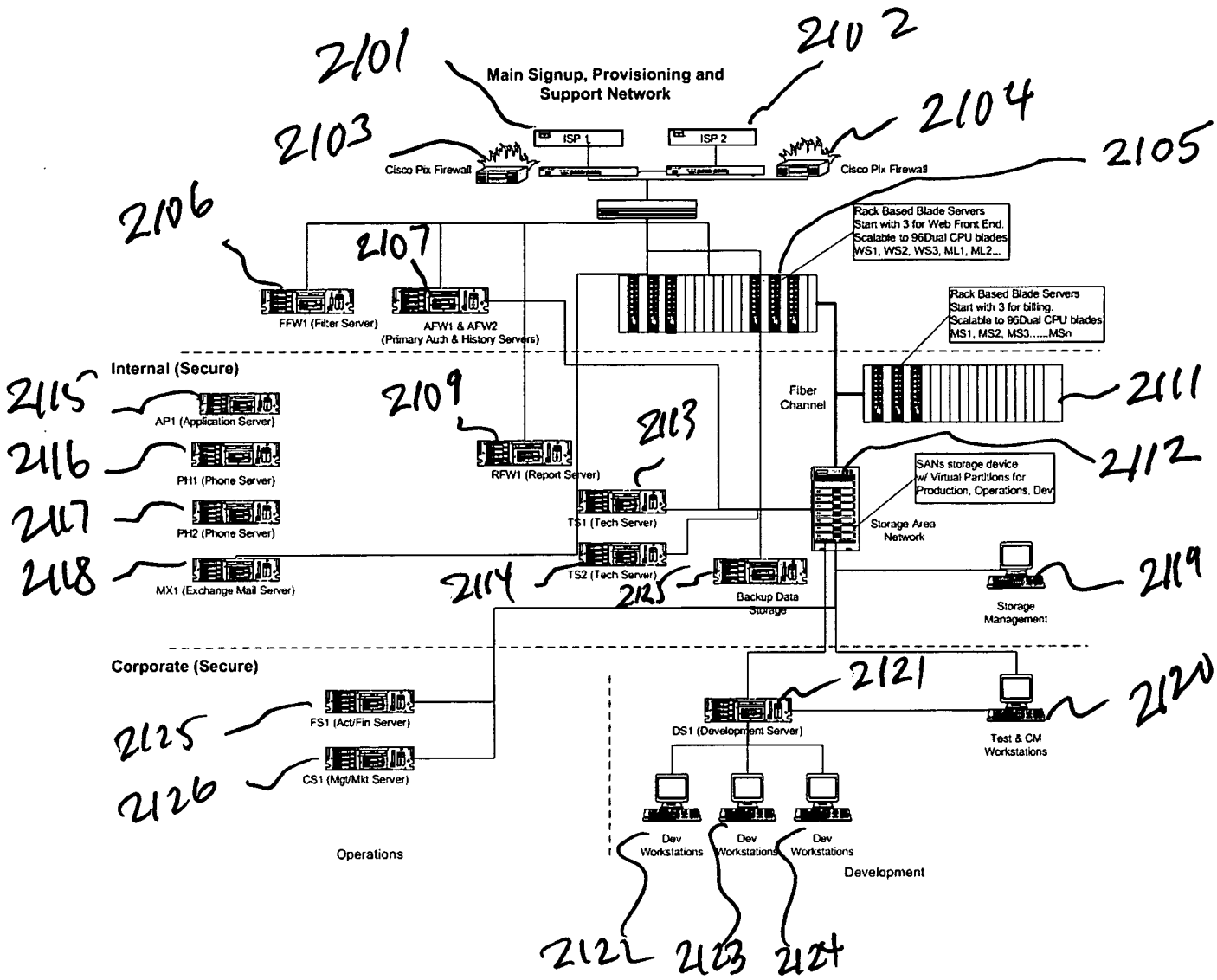

2101
Main Signup, Provisioning and Support Network
2102
2103
2104
2105
2106
2107
ISP 1
ISP 2
Cisco Pix Firewall
Cisco Pix Firewall
Rack Based Blade Servers Start with 3 for Web Front End. Scalable to 96Dual CPU blades WS1, WS2, WS3, ML1, ML2...
Rack Based Blade Servers Start with 3 for billing. Scalable to 96Dual CPU blades MS1, MS2, MS3.....MSn
FFW1 (Filter Server)
AFW1 & AFW2 (Primary Auth & History Servers)
Internal (Secure)
2115
AP1 (Application Server)
2116
PH1 (Phone Server)
2117
PH2 (Phone Server)
2118
MX1 (Exchange Mail Server)
2109
RFW1 (Report Server)
2113
TS1 (Tech Server)
TS2 (Tech Server)
2114
2123
Backup Data Storage
Fiber Channel
2111
2112
SANs storage device w/ Virtual Partitions for Production, Operations, Dev
Storage Area Network
2119
Storage Management
Corporate (Secure)
2121
2120
DS1 (Development Server)
Test & CM Workstations
2125
FS1 (Act/Fin Server)
2126
CS1 (Mgt/Mkt Server)
Operations
Dev Workstations
Dev Workstations
Dev Workstations
Development
2122
2123
2124

FIG 21

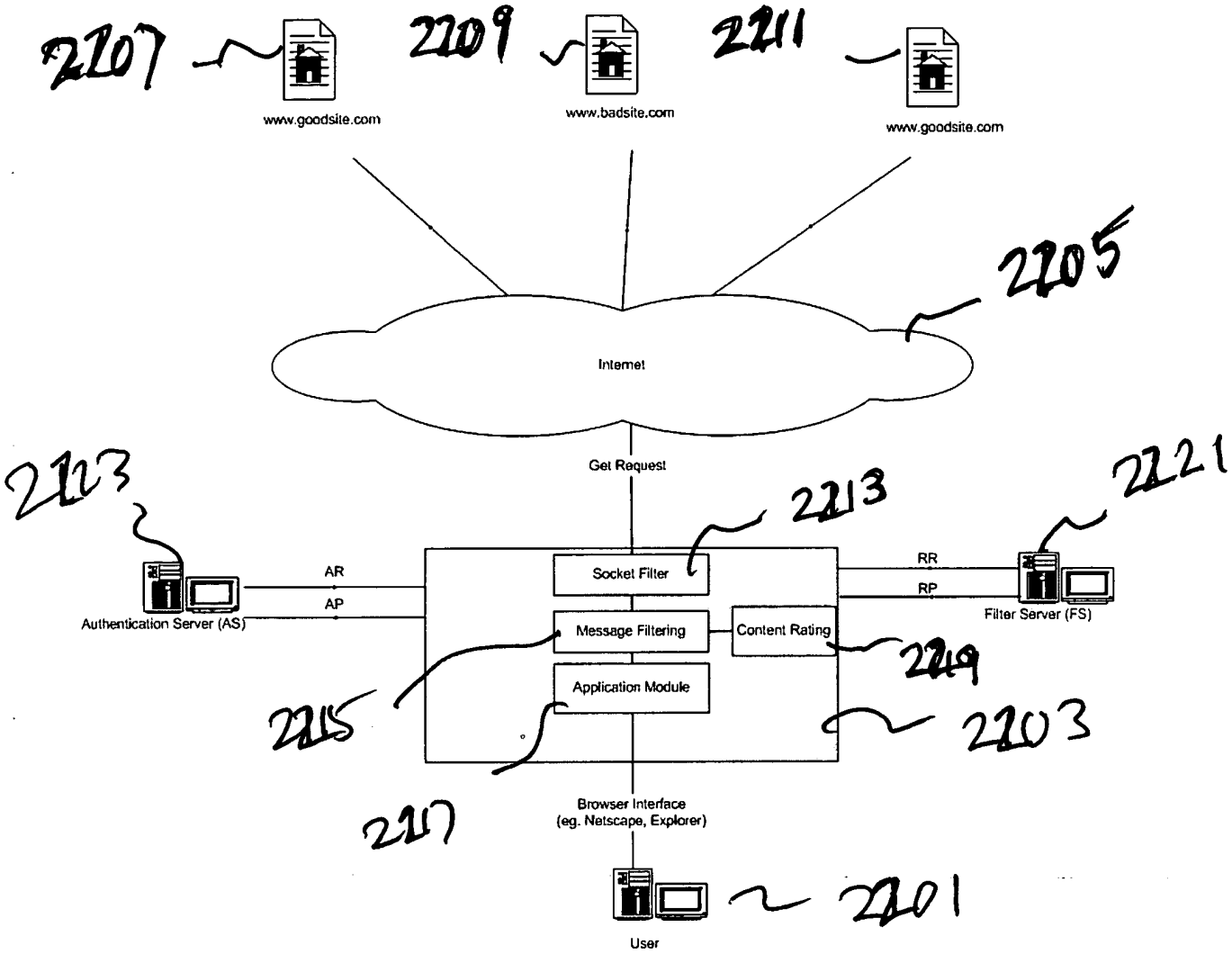

Content Filter Component
2207
2209
2211
www.goodsite.com
www.badsite.com
www.goodsite.com
2205
Internet
Get Request
2223
2213
2221
Socket Filter
AR
AP
RR
RP
Authentication Server (AS)
Filter Server (FS)
Message Filtering
Content Rating
2219
Application Module
2215
2203
2217
Browser Interface
(eg. Netscape, Explorer)
User
2201

FIG 22

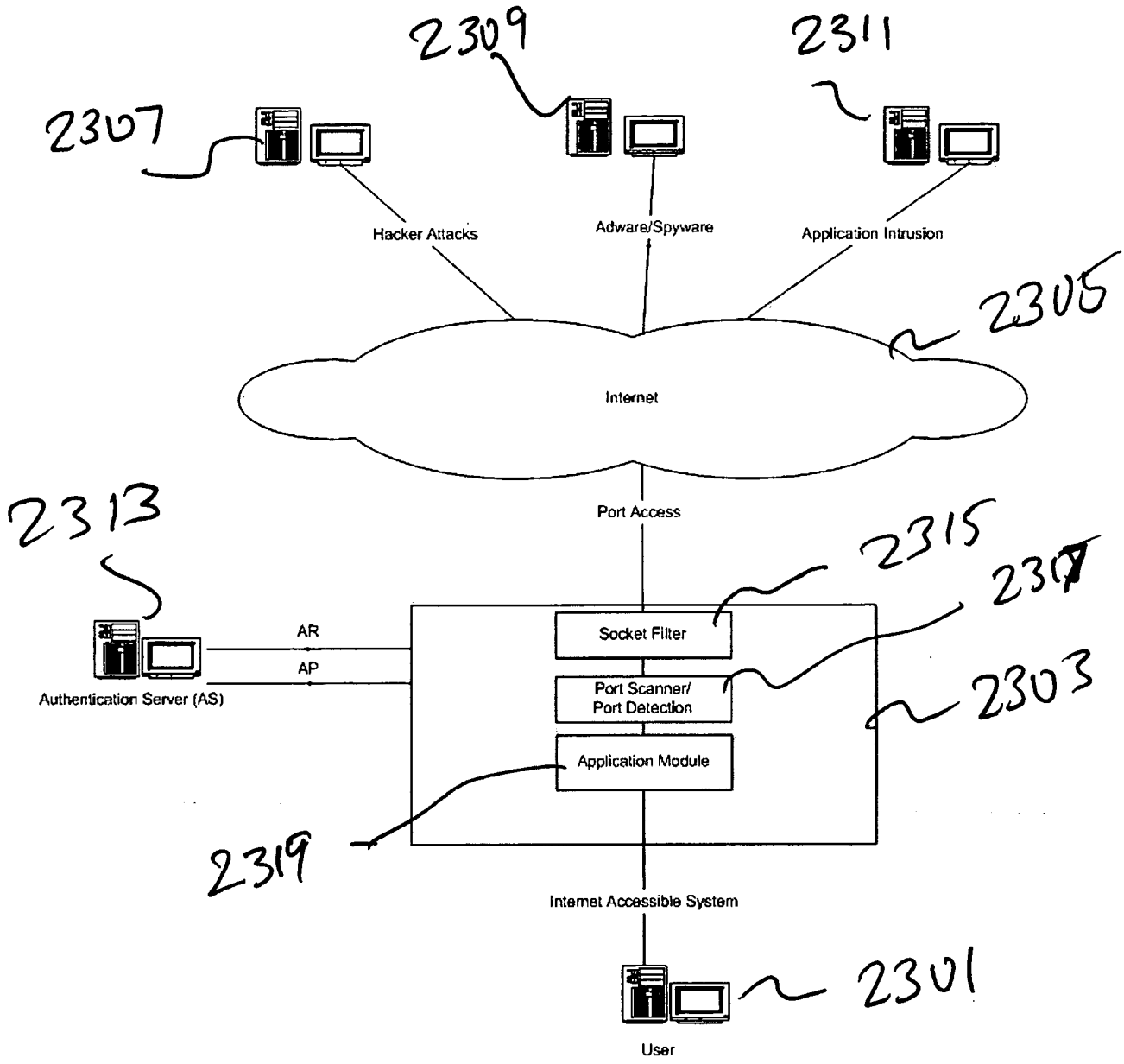

Personal Firewall Component
2309
2311
2307
Hacker Attacks
Adware/Spyware
Application Intrusion
2305
Internet
Port Access
2313
2315
2317
2303
AR
AP
Socket Filter
Port Scanner/
Port Detection
Application Module
Authentication Server (AS)
2319
Internet Accessible System
2301
User

FIG 23

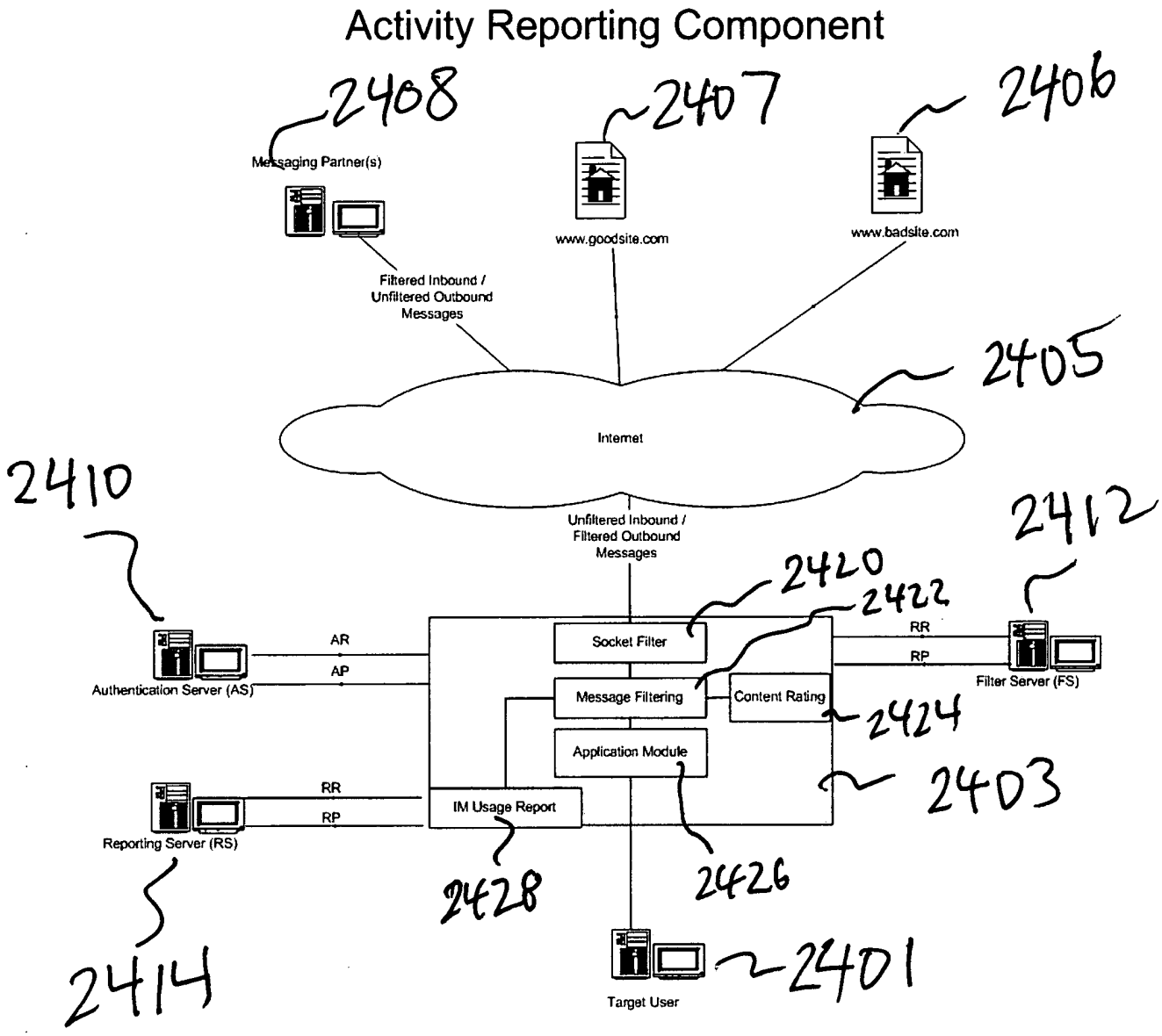

Activity Reporting Component
2408
2407
2406
Messaging Partner(s)
www.goodsite.com
www.badsite.com
Filtered Inbound / Unfiltered Outbound Messages
2405
Internet
2410
Unfiltered Inbound / Filtered Outbound Messages
2412
2420
2422
Socket Filter
Message Filtering
Content Rating
2424
Application Module
2403
AR
AP
RR
RP
Authentication Server (AS)
Filter Server (FS)
RR
RP
IM Usage Report
Reporting Server (RS)
2428
2426
2414
2401
Target User

FIG 24

Anti Virus Protection Component

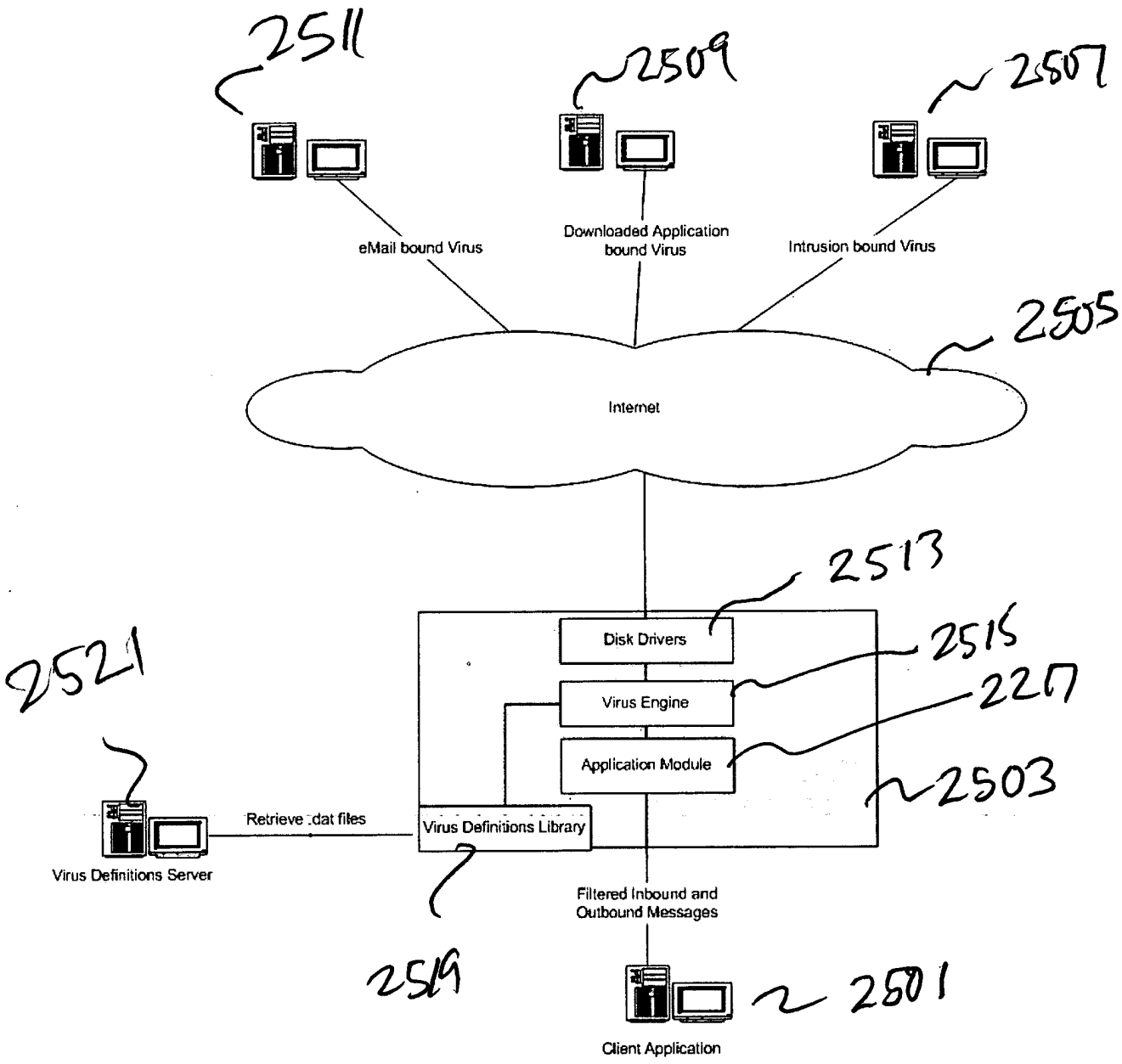


FIG 25

Instant Message Filter Component

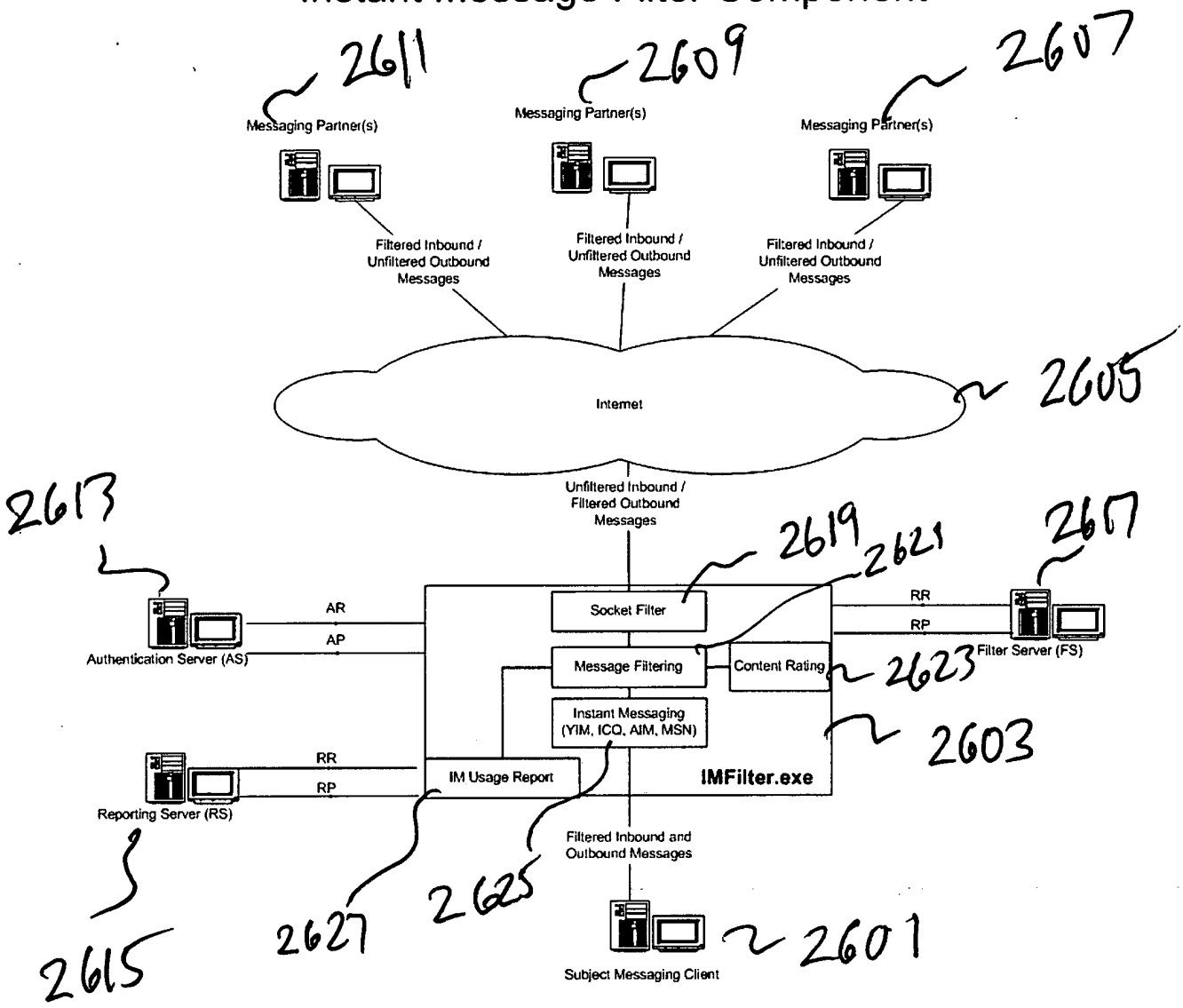


FIG 26

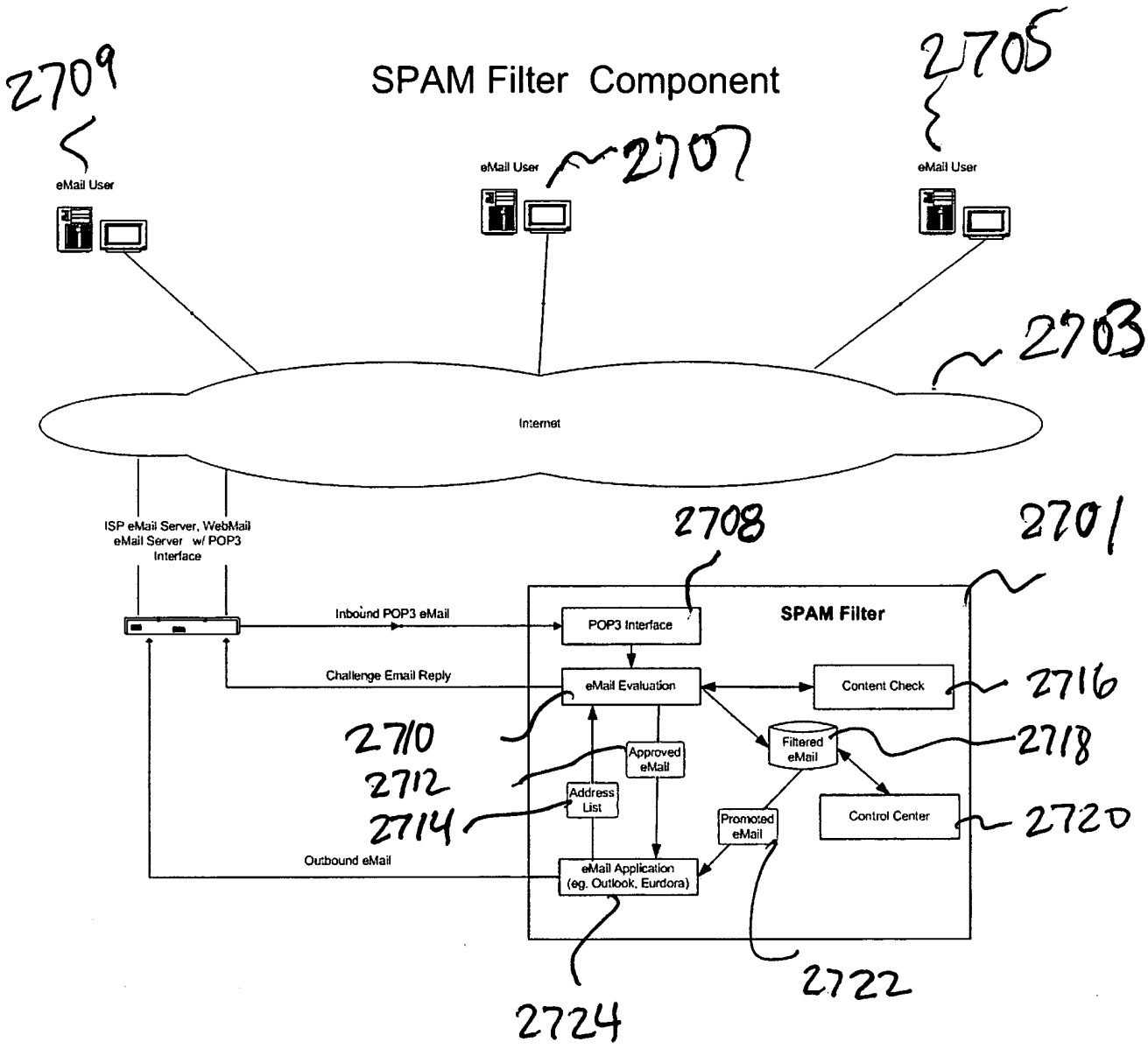

SPAM Filter Component
2709
2705
2707
eMail User
eMail User
eMail User
2703
Internet
ISP eMail Server, WebMail
eMail Server w/ POP3
Interface
2708
2701
SPAM Filter
Inbound POP3 eMail
POP3 Interface
Challenge Email Reply
eMail Evaluation
Content Check
2716
2710
2712
2714
Approved
eMail
Filtered
eMail
2718
Address
List
Promoted
eMail
Control Center
2720
Outbound eMail
eMail Application
(eg. Outlook, Eurdora)
2722
2724

FIG 27

Bsafe Accountability System - Multi-User Report

[redacted] LOGGED IN

MULTI-USER REPORT CONSOLE

Welcome to the Multi-user Console, where you can view NetAccountability log information for many users at once. Here we list the top 10 URLs for each person in your organization -- regardless of page ranking. In other words, these are the 10 worst -- but assuming that most of your users are keeping clean online, this in most cases will just be a list of the "least good". Each column can be sorted by clicking on that column's header -- and you can turn on and off the "URL listing" feature by clicking on the "+/-" at the top left of the list.

[+] [-]

FIRST NAME	LAST NAME	STATUS	
[redacted]	[redacted]		VIEW DETAILED STATS
[redacted]	[redacted]		VIEW DETAILED STATS
[redacted]	[redacted]		VIEW DETAILED STATS
[redacted]	[redacted]		VIEW DETAILED STATS
[redacted]	[redacted]		VIEW DETAILED STATS
[redacted]	[redacted]		VIEW DETAILED STATS
[redacted]	[redacted]		VIEW DETAILED STATS

FIG 28

Bsafe Accountability System - Single User Report

SITES VISITED

PRINT

WEDNESDAY

Start Time	Site	Machine ID	Rating	
01:55 PM	[±] ad.doubleclick.net [2]	Laptop	Not Rated	☐
04:06 PM	[±] ads.addesktop.com [5]	Laptop	Not Rated	☐
01:55 PM	[±] amch.questionmarket.com [3]	Laptop	Not Rated	☐
02:06 PM	[±] communications.msn.com [1]	Laptop	Not Rated	☐
03:03 PM	[±] dovm.plaxo.com [2]	Laptop	Not Rated	☐
01:55 PM	[±] m3.doubleclick.net [2]	Laptop	Not Rated	☐
01:48 PM	[±] news.google.com [8]	Laptop	Not Rated	☐
01:48 PM	[±] pagead2.googlesyndication.com [4]	Laptop	Not Rated	☐
09:26 AM	[±] sa.windows.com [6]	Laptop	Not Rated	☐
01:55 PM	[±] server-us.imrworldwide.com [1]	Laptop	Not Rated	☐
01:48 PM	[±] update.adobe.com [1]	Laptop	Not Rated	☐
01:48 PM	[±] www.crosswalk.com [7]	Laptop	Medium	☒
04:06 PM	[±] www.csmonitor.com [1]	Laptop	Not Rated	☐
09:05 AM	[±] www.download.windowsupdate.com [1]	Laptop	Not Rated	☐
01:55 PM	[±] www.forbes.com [1]	Laptop	Not Rated	☐
04:53 PM	[±] www.naf.com [1]	Laptop	Not Rated	☐

FIG 29